Institute for Research on Public Policy ◦ Institut de recherches politiques ◦

Institute discussion papers on topics within the Studies in Social Policy program are circulated to elicit constructive dialogue. Papers are available at $5.00 per copy; and cheques should be made payable to the Institute for Research on Public Policy. Requests for papers should be directed to:

Les documents de travail utilisés dans le cadre du programme des Études en politique sociale sont mis en circulation dans le but de favoriser le dialogue. Ils se vendent au prix de 5 $ l'exemplaire, payables par chèque établi à l'order de l'Institut de recherches politiques. Les commandes doivent être addressées à:

The Institute for Research on Public Policy/L'Institut de recherches politiques
P.O. Box 3670 South
Halifax, NS
B3J 3K6

The Studies in Social Policy program of The Institute for Research on Public Policy involves research on the interrelationships among demographic, economic and social trends in Canada. The research focus is in three areas: demographic/economic/social interrelations; immigration issues; and social policy, including income security.

This document expresses the views of the author; it does not necessarily represent the views of the Institute, nor those of the organizations which provided financial assistance for its completion.

Le programme des Études en politique sociale de l'Institut consiste notamment à examiner les liens qui existent entre les tendances démographiques, économiques et sociales au Canada. Les recherches sont axées sur trois domaines: les relations entre les tendances démographiques, économiques et sociales; les questions d'immigration; et politique sociale, y compris la sécurité du revenu.

Les opinions exprimées dans ce document n'engagent que leur auteur; elles ne reflétent pas nècessairement celles de l'Institut ni celles des organismes qui ont financè sa prèparation.

DISTRIBUTIONAL IMPACTS OF PERSONAL INCOME TAX REFORM

1984 TO 1988

by

ALLAN M. MASLOVE*
SCHOLAR-IN-RESIDENCE
INSTITUTE FOR RESEARCH ON PUBLIC POLICY

JUNE 1988

* Allan Maslove, who conducted this study as a Scholar-in-Residence associated with the Institute's Studies in Social Policy Program, is a Professor in the School of Public Administration at Carleton University.

The author is deeply indebted to Michael Wolfson and his colleagues in the Social and Economic Studies Division, Statistics Canada for providing access to the database and simulation model which underlies this analysis. The author accepts responsibility for the assumptions implicit in the various scenarios that have been simulated.

89-05483/

Table of Contents

	Page
Preface	v
Introduction	1
Fiscal Impacts	2
General Distributional Impacts	3
Gainers and Losers by Income Group	4
The Components of Tax Reform	5
Impacts by Family Type	6
Horizontal Equity	8
Marginal Tax Rates	9
Summary and Highlights	13
Notes	15
Tables	17
Charts	22
Appendix	59

Preface

The purpose of this study is to analyze the distributional impact of changes in the federal personal income tax system over the period 1984 to 1988, including the major reforms introduced in 1987 and implemented in 1988. While the study assesses the aggregate fiscal impacts of reform, the emphasis is on an analysis of the gains and losses in disposable income experienced by families at different levels of income. The study also assesses the impact of reform on different types of families, including families with at least one child under the age of 18, and elderly families with at least one member aged 65 or over. The analysis of corporate and sales tax changes is not included in this study.

The detailed findings of the study are included in the Summary and Highlights of the report. While all of these findings are significant, the following are particularly important from a public policy perspective. All figures are in 1984 dollars, and total incomes remain constant throughout the analysis. (Note that some parts of the tax reform package were not explicitly examined, although they do not change the general tenor of these results.)

- In the absence of the personal income tax reforms introduced in 1987, aggregate tax increases between 1984 and 1988 would have been $6.5 billion. After the personal income tax reforms were implemented in 1988, this figure declined to $3.4 billion. The average decrease in disposable income between 1984 and post-reform 1988 was $340 per family.

- Depending on income level, families are affected differently by tax changes. If the 1987 personal tax reforms had not been implemented in 1988, all families, except those earning less than $9,010 (i.e., the lowest 20 per cent of families) would have had less disposable income in 1988 than they had in 1984. After tax reforms were introduced in 1988, two income groups were better off than in 1984: the lowest 30 per cent of families and the top 1 per cent. The largest gains in disposable income accrued to the top 1 per cent, averaging $3,570, or 2.7 per cent and to the lowest 10 per cent, averaging $90, or 2.3 per cent.

- While Canadian families in all income groups faced lower income taxes as a result of the 1987 tax reforms, the majority of families were still worse off in terms of disposable income in 1988 than they were in 1984. All families earning approximately $13,000 - $117,000 had lower disposable incomes in post-reform 1988 than they had in 1984. In percentage terms, the decreases were greatest for families with total incomes between about $29,000 and $43,000. In effect, a large proportion of the losers were middle-income families.

- Certain types of families were protected during the period 1984 to 1988. For example, the majority of elderly family units were gainers with reform, both compared to their situation in 1984 and in 1988 without reform. Also, the lowest 17 per cent of families with at least one child under the age of 18 experienced gains between 1984 and 1988, both before and after reform. These gains reflect the enrichment of the Refundable

Child Tax Credit and the introduction and later enrichment of the Refundable Sales Tax Credit.

This study, which was initiated in discussions between the Institute for Research on Public Policy and the author, Professor Allan Maslove, is based on a Statistics Canada database and computer model, called the Social Policy Simulation Database/Model (SPSD/M). The Institute and the author are grateful to Michael Wolfson and his colleagues in the Social and Economic Studies Division at Statistics Canada for providing access to a prototype version of the SPSD/M.

This paper will comprise a portion of a larger study by Allan Maslove, which will also include an analysis of the process of tax reform in Canada. The Institute expects to publish this broader study later this year.

Shirley B. Seward
Director
Studies in Social Policy

Distributional Impacts of Personal Income Tax Reform 1984 to 1988

Introduction

This discussion paper presents a quantitative analysis of major changes that have occurred in the federal personal income tax system over the last four years. This period is notable, among other things, because of the partial de-indexing of the tax system and the introduction of major tax reforms in 1987. The main focus of this analysis is on estimating the gains and losses in disposable incomes resulting from personal income tax changes experienced by families at different levels of income. Corporate and sales tax changes are not included in the analysis.

Before discussing the substantive results of the analysis, it is important to understand the method by which the results have been obtained. The analysis is based on a new experimental database and computer model developed by Statistics Canada, called the Social Policy Simulation Database/Model (SPSD/M). The database contains information on a representative sample of over 100,000 individuals living in over 40,000 households. The associated computer model is able to simulate, for each individual and family in the database, the income tax calculations under a variety of policy scenarios.

The simulation is a mechanical accounting exercise. It assumes that the only impact of a change in tax policy is a change in the tax return form. Taxpayers are not assumed to change their behaviour in any way in response to the policy changes. While such a static modelling approach is undoubtedly incomplete, it does give a good sense of the first round impact of the policy changes. The same modelling approach is used by the federal Department of Finance, for example, and by various agencies in the U.S. involved in the recent American tax reform.[1]

Tax reform is being implemented for the 1988 taxation year. However, various participants in the debate on tax reform have tended to make two quite different kinds of comparisons in assessing the reform proposals. Some have focussed on comparing the 1988 post-reform situation with what tax policy would have been in 1988 without the reforms. Others have compared 1988 after reform with the situation in 1984 when the current government came to power.

This analysis addresses both perspectives by simulating all three scenarios. All simulations are based on a sample of Canadian households for 1984. All dollar values are at 1984 levels. For example, simulations for 1988 are based on tax parameters that have been adjusted to 1984 dollar values using the Consumer Price Index. Using this common population and income base, tax burdens are estimated for the income tax system as it existed in 1984 (referred to as 1984 status quo or SQ84), as it would have existed in 1988 without the tax reform (referred to as 1988 status quo or SQ88), and as it would exist in 1988 with all the reform measures fully implemented (referred to as 1988 post reform or PR88). Thus it is possible to offer comparisons between tax burdens in SQ88 and SQ84, between PR88 and SQ88, and between PR88 and SQ84. Through these successive comparisons we can "track" the aggregate fiscal impacts and the distributional changes from 1984 to full implementation of

the reforms. Conducting the analysis over this time period enables us to offer results relevant to the current policy debates over the level and distribution of tax burdens. Changes in provincial personal income tax liabilities are included in the results under the assumption the provincial governments do not adjust their tax rates in response to the federal changes. Sales tax and corporate income tax changes that have occurred since 1984 are not included in this analysis (though the SPSD/M can also be used to analyze the former).

The results presented in this paper refer to the changes in the personal income tax system that were announced in the White Paper of June 1987; subsequent alterations, which are small by comparison, are not included in the analysis.[2] The paper examines the distributional impacts on the total population, and on selected family types. It analyses the impacts of the total reform package as well as its major components. The latter analysis enables us to explain the overall results more clearly and with more precision. The paper also addresses the issue of horizontal equity by examining the dispersion of average tax rates within income classes. Finally, the paper examines changes in marginal tax rates facing taxpayers who are at various income levels and who derive incomes from various sources. Marginal tax rates directly relate to the question of economic incentives which was another major concern of the tax reform exercise.

The changes in the tax structure between SQ84, SQ88, and PR88 are outlined in Table 1, which describes the particular tax policy changes involved in moving through these scenarios. The 1988 personal income tax reform can be considered to consist of three main groups of proposals – broadening the base of the income tax, converting personal and other exemptions and deductions to tax credits, and changing the tax rate structure. It should be noted that the analysis does not cover all of the changes, though it does cover a very large portion including all of the major changes.

Chart 1 shows the changes in the 1988 tax rate structure proposed in the tax reform. The current ten marginal tax rates brackets are reduced to three and, in general, the rates that apply to these brackets are lowered.

Fiscal Impacts

Table 2 presents a summary of the aggregate fiscal impacts of the tax policy changes as estimated by the SPSD/M. It should be recalled that the 1988 pre- and post-reform scenarios (SQ88 and PR88) have been estimated *as if* all the tax policies were in place in 1984. All dollar amounts are in 1984 values, and economic changes from 1984 to 1988 have been ignored. As a result, total incomes remain the same in all three scenarios, except for a small decline in family allowance receipts between SQ84 and SQ88 as a result of the partial de-indexing that was introduced in 1985. In effect, the analysis abstracts from economic growth; it shows the "pure effects" of tax policy changes without the influences of changes in parameters such as employment and wages.

Between SQ84 and SQ88 federal (and provincial) income tax revenues increase substantially ($4.9 and $1.0 billion respectively), purely as a result of the changes outlined in Table 1 (i.e., in the absence of any economic growth or decline). These income tax increases,

along with smaller changes in UI and CPP/QPP premiums, result in an aggregate decline in disposable incomes of $6.5 billion or 2.7% of the 1984 level. As Table 1 notes, one of the major items included in this period was actually introduced prior to 1984. In moving from SQ88 to PR88, federal and provincial revenues decline by approximately half their earlier increase. The net change when comparing PR88 to SQ84 is an increase in tax revenues matched by a corresponding decline in disposable income of $3.4 billion. This amounts to a 1.4% overall reduction in household disposable income.

General Distributional Impacts

Table 3 presents an overall picture of the distribution of tax burdens for each of the three tax policy scenarios. Between SQ84 and SQ88 overall disposable incomes decrease by an average of 2.7%. With the 1988 post-reform system, tax cuts increase overall disposable incomes by about 1.3%, leaving overall average disposable incomes 1.4% lower than they were in SQ84. In absolute terms, family disposable incomes fall by an average of $650 between SQ84 and SQ88 and then rise by an average of $310 with reform.

Within this general pattern, average effective tax rates[3] decrease (and hence disposable incomes increase) for the lowest 20% of family units between SQ84 and SQ88 and for the lowest 30% between SQ84 and PR88. The highest income 1% of families experience a tax increase between SQ84 and SQ88, but an even larger decrease in moving to PR88. For all income groups, average tax rates increase when moving from SQ84 to SQ88 and then decline with the reforms, but only part way to their earlier levels.

In comparing SQ88 to SQ84, disposable incomes rise for the lowest 20% of the population, and fall for all other groups. The largest declines in disposable incomes in percentage terms are experienced by families with total incomes between about $23,000 and $43,000. When moving from SQ88 to the reform scenario, disposable incomes of all income groups increase. The smallest increases in both dollar and percentage terms accrue to the lowest 20% of families and the largest increase (both dollar and percentage) goes to the top 1%. Over the whole period (SQ84 to PR88), the lowest 30% and the top 1% of families experience increases in disposable incomes; all others experience declines. In percentage terms the decreases are greatest for families with total incomes between about $29,000 and $43,000. The largest gains, which accrue to the top 1%, average $3570 or 2.7%.[4] Based on these changes in disposable incomes over the period 1984 to PR88, the tax changes were progressive in their impact for the lowest 80% of families (i.e., up to about $43,000 in income) and regressive for the upper income 20% of families. (The words "progressive" and "regressive" are used in their technical sense; for example, progressive tax changes effect redistribution from higher to lower income groups.)

These results are illustrated graphically in Charts 2 and 3. Chart 2 shows the average tax rates (ATRs) for each of the income groups for each of the three scenarios. The horizontal axis represents what we call "percentile income groups", defined exactly as in the rows of Table 3. This axis is not measured in dollars of income, but rather, in percentages of the population of families sorted in ascending order of income. Generally, the population has been divided into tenths (or deciles). The exception is the top decile which has been sub-

divided into the 90% to 95%, 95% to 99%, and top 1% groups. The levels of total family income (in 1984) which serve as the dividing points for these income groups are given in Table 3.

This detailed description of the horizontal axis in Chart 2 is emphasized for several reasons. First, many readers may find it unusual; most often, graphs of the impact of a policy change by income group use dollars of income along the horizontal axis. Second, this same horizontal axis expressed in terms of percentile income groups appears in almost all the charts to follow. Finally, this type of presentation gives a more accurate impression of distributional impacts: while there are Canadians with very high incomes, they form a small proportion of the population. With percentile income groups rather than income per se as the horizontal axis, the relative positions of high income families are more accurately represented.

According to the usual definition, each tax regime represented in Chart 2 is progressive throughout the entire income spectrum: taxes as a proportion of income rise continually with increasing levels of income. (Negative average tax rates are the result of refundable tax credits.) Charts 2 and 3 also reflect the results reported in Table 3. The changes between SQ84 and SQ88, particularly in Chart 3, show the decline in ATRs for the lowest income groups and the increases for the rest, with the middle groups experiencing the greatest increases in percentage terms. The difference between PR88 and SQ88 reflects the reductions in taxes that flow on average to all income groups. The SQ88 versus SQ84 curve in Chart 3 shows that the overall tax increase was progressive for the bottom two-thirds of the population, and regressive for the top one-third. In contrast, the PR88 versus SQ88 curve appears much flatter except for the top 1%. In this context, the 1988 tax reform appears closer to being distributionally neutral than the tax policy changes from 1984 to 1988. Finally, the PR88-SQ84 line in Chart 3 demonstrates that the reform reversed part of the tax increases during the previous period. The bottom 30% and the highest 1% emerge as the net gainers and families in the 60th to 80th percentile ranges were the biggest losers. The tax changes appear progressive for the bottom 80% (up to about $43,000 of income) and regressive above that point.

Gainers and Losers by Income Group

Charts 4.1 to 4.3 highlight the distributions of gainers and losers in each of the three scenario comparisons. Chart 4.1, which compares SQ88 with SQ84, clearly illustrates that, except for the bottom one-fifth of the population, losers outnumber gainers at all income groups. In the first two deciles gainers dominate losers by a wide margin. From the third to the eighth deciles, losers dominate and the proportion of losers continuously increases. From the 80th percentile to the top 1% of the population, the proportion of losers declines, but still dominates gainers by large margins.

Chart 4.2, which compares PR88 to SQ88, shows that virtually everyone benefits from tax reform. On the other hand, Chart 4.3 shows that in an examination of the whole period from SQ84 to PR88, the majority of taxpayers would still pay more income tax if the 1988 post-reform tax system had been in place in 1984. The distribution of gainers and losers by income group in this comparison is notable. For the first three decile income groups, gainers

are in the majority, but the proportions decline as we move up the income scale. At the other extreme, approximately 70% of the top 1% of the population are gainers. For all the remaining middle income groups, losers dominate gainers by large margins.

The Components of Tax Reform

Chart 5 presents an overview of the impacts of the components of the tax reform as they affect the total population. Before discussing these results, a brief explanation of the procedure is required. The results displayed in Chart 5 simulate the distributional impact of each of the three components of the reform package compared to the 1988 system without reform as if each of these components was enacted by itself. Thus we can examine the effect of the shift from deductions and exemptions to credits by itself, the effect of base broadening by itself, and the effect of changing the rate structure (and the expansion of refundable credits) by itself. In this way we can decompose the aggregate distributional impacts shown in the earlier charts. (Note that the three components cannot simply be summed to equal the total impacts because doing so would not capture interaction effects.)

The move from deductions and exemptions to tax credits (SQ88C-SQ88) on average, benefitted those in the lower portion of the income distribution, and increased taxes for those in the upper portion. The crossover point occurs about two-thirds of the way up the income spectrum (that is, between the 60th and 70th percentile of the population). Generally speaking, the move to credits is progressive in the sense that the resulting tax changes (in percentage terms) increase with income. The exceptions to this pattern are the two tails of the income scale, the bottom 30% (though these groups are clear gainers) and the top 1%.

The base broadening component (SQ88BB-SQ88) appears to be progressive at the two tails of the income distribution – the bottom 30% and the top 1% – and basically proportional in between. As one would expect, the impact of base broadening by itself is an increase in income taxes for taxpayers at all income levels. The remaining line in Chart 5 describes the effect of the changes in the rate structure (recall Chart 1) and the refundable federal sales tax credits (SQ88RR/FSTC-SQ88). If this set of changes alone were made, the first decile group would experience a decline in taxes, the next four decile groups would experience tax increases, and the remainder (approximately the top 50% of families) would enjoy tax decreases. Generally, this component of tax reform is regressive in that it confers proportionately larger benefits as incomes increase. The exception to this statement is the progressivity shown in the bottom 30% of the income distribution which reflects the enrichment of the refundable tax credits. The benefits of the lower rates are particularly pronounced in the upper portion of the income scale. For the top 1% of the population, these benefits outweigh the tax increases from the first two components of the reform.

In fiscal terms, the conversion to tax credits results in both tax increases and tax decreases, and overall is roughly neutral in terms of revenue. Base broadening increases total revenue. Tax rate restructuring and enrichments of the sales tax credit result in an even larger reduction in revenue.

In the analysis so far, several points stand out. There clearly has been an overall increase in personal income taxes since 1984 and this increase has been moderated but not reversed by the tax reform of 1987-88. Within that general pattern two exceptions stand out. The lowest income 20% to 30% of the population has been sheltered from the tax increases, and indeed, for given total incomes, most families in these income groups have higher disposable incomes after reform than they did in 1984. These gains are, for the most part, attributable to the enrichments in the refundable child tax credit that occurred during this period, the introduction and subsequent enrichment of the refundable sales tax credit, and the conversion of deductions and exemptions to tax credits in the reform.

The other exception to the general pattern is the top 1% of families in the income spectrum. In the period leading up to the reform, their tax increases were more moderate than were the increases experienced by most of the middle and upper income groups, reflecting the influence of measures such as the $500,000 lifetime capital gains exemption introduced in that period. Further, in the reform exercise itself, the top 1% experienced major gains, largely as a result of the rate restructuring which significantly lowered the highest marginal tax rate in the system. As a result, this group emerged as the biggest gainers both in terms of dollars and as a percentage of 1984 disposable incomes.

Finally, because the bottom third and the top 1% of the income scale are exceptions to the overall pattern, those left between these tails on average experience tax increases compared to their situations in 1984. In fact, the tax increases falling on this group amount to the $3.4 billion aggregate decline in disposable incomes reported in the simulations (1984 to PR88), plus an amount equal to the tax decreases flowing to the lowest 30% and the top 1% (approximately $0.5 billion).

Impacts by Family Type

We now turn to an examination of the impact of the three tax scenarios on three different family types. These are the FA or family allowance group which includes all family units with at least one child under the age of 18, the OAS group which includes all family units with at least one member aged 65 or over, and the OTHER group which includes singles, couples with no children, and couples and single parents with only older children living at home. Chart 6 provides a first look at these groups for the SQ84 tax regime. It should be noted that the percentile income groups in this chart (and the following three) refer to the total population, not to the family type subgroups. Table 4 shows the proportions of each family type falling within each overall percentile income group. The FA population has above average income while the OAS population is concentrated in the 2nd to 4th deciles.

In 1984 (Chart 6) the FA population in the first three decile groups (17% in Table 4) faced negative ATRs, reflecting the operation of the refundable child tax credit. The FA line is also on average the steepest of the three, which can loosely be interpreted as being the most progressive of the three groups. The ATRs of the OAS group are all positive in 1984, and as well the tax line for this group appears for the most part to be less progressive.[5] Finally, the remaining group (OTHER) faces the highest tax structure overall. Comparing Charts 2 and 6,

it is evident that the differences in ATRs among families at a point in time (1984) are greater than the changes brought about by various tax policies over the 1984 to 1988 period.

Charts 7.1 to 7.3 provide comparisons among the tax scenarios for each of the three family types in turn. In the FA population (Chart 7.1), families in the first three decile groups (17% of the FA population) experience gains in moving from SQ84 to SQ88 (more favourable negative ATRs), reflecting enrichments in the refundable child tax credit and the new sales tax credit, but FA units in all the other income groups face higher tax rates in SQ88 than they did in SQ84. Chart 7.1 indicates that in moving from SQ84 to SQ88, the tax structure became more progressive for FA family units in the first seven decile groups (58% of the FA population). Tax increases experienced by families in the top three decile groups, on the other hand, were regressive; 42% of FA family units are in these income groups.

In moving from SQ88 to PR88, Chart 7.1 shows that average tax rates fall for FA families at all income levels. As was the case for all family groups combined (Chart 3), the curve is relatively flat, suggesting that (except for the top 1%) the reform initiatives were roughly distributionally neutral for the FA population. The comparison of the reform regime with 1984 incorporates the two earlier changes. The first three decile groups enjoy lower average tax rates. The next group, up to the highest percentile, experience increased tax rates, with the increases being progressive through the seventh decile group. The average tax rate for families in the top 1% of the income scale (1.4% of FA units) declines after tax reform compared to 1984. The December 1987 amendments to the White Paper proposals increased the refundable child tax credit by $35. This change would further increase the gains accruing to the lower income groups of the FA population. In particular, the gains to the first three decile groups shown in Chart 7.1 would be increased.

For the OAS population (Chart 7.2), units in the first two decile groups (32% of the OAS total) experience, on average, reduced ATRs when moving from SQ84 to SQ88, reflecting the introduction of the refundable sales tax credit during this period. OAS family units in all the remaining income groups face higher tax rates. Those in the top 1% (0.7% of the OAS group) experience the smallest relative tax increase. Between SQ88 and PR88, average tax rates fell for all income groups , with those in the 5th and 6th decile groups enjoying the largest percentage declines. Finally, in comparing the post-reform 1988 system with 1984, average tax rates fall for those in the first six decile groups and for those in the top 1%. The remainder, 16% of the OAS population, experience tax rate increases.

Perhaps the most interesting results in Chart 7.2 are that, in the PR88 scenario, OAS family units in the first six decile groups are gainers compared to their situations both in SQ88 and SQ84. Over eighty percent of OAS family units fall into these first six decile groups. Their gains in disposable incomes range from about $30 to $70 per family unit (compared to 1984) or about $20 to $670 per unit compared to SQ88. In addition, the OAS families in the top percentile group (0.7% of OAS families) are also better off than they were in either of the two previous tax regimes. The OAS group thus stands out in that over the entire period about 80% of the family units in this group experience declines in their average tax rates. What appears to account for these changes are the introduction and later enrichment of the sales tax credit, and the switch from deductions and exemptions to credits

in the reform exercise, particularly of those items directed specifically to the over 65 population.

The distributional impacts on the remaining population group (OTHER) are presented in Chart 7.3. Between SQ84 and SQ88, the average tax rate falls for the first decile group (16% of the OTHER population) and basically remains unchanged for the top 1% (0.8% of the group). The average tax rates increase for the remainder of this group and do so at fairly uniform rates in percentage terms. In moving from SQ88 to the post-reform system, average tax rates fall at all income levels. Again the decline is fairly uniform in percentage terms with the exception of the top 1% which receives the largest decrease. When comparing the post-reform system to 1984, the Chart shows that the first decile group and the top 1% group enjoy reduced average tax rates. Indeed, the average gains in disposable income for the latter group amount to $4000. All other family units in this group gain compared to SQ88 but lose compared to SQ84. The average tax increases (since 1984) are at fairly uniform rates.

This examination of distributional impacts by family type suggests that some care was taken in the design of the changes with respect to at least two groups. Elderly family units, those containing at least one person aged 65 or older, have clearly done well relative to other groups and relative to their position in 1984. Secondly, families at the low end of the income scale have been protected. There is at least the suggestion in these results that single parent families were of particular concern. Beyond these "target" groups, it is also clear that family units in the top 1% of the income distribution are gainers, regardless of their family type.

Horizontal Equity

One of the fundamental objectives in the design of any tax system is horizontal equity. While there are many facets of this concept, one indicator is the dispersion of average tax rates that occurs among families at given income levels. Table 5 and Charts 8 and 9 provide summaries of such variations in average tax rates (ATRs). Chart 8 shows the dispersion in ATRs for the middle 50% and the middle 90% of the population for each percentile income group in 1984. Chart 9 indicates how the cut-off points for the 90% band have moved for SQ88 and PR88. These charts are constructed as follows: within each income group families are ranked in order of ATRs. Thus, for example, the middle 90% of a given percentile income group indicates the range or dispersion of ATRs for 90% of families in that group, excluding the 5% of the group with the highest ATRs and the 5% with the lowest ATRs.

While no single description characterizes the pattern at all income levels, several points are noteworthy. Chart 8 shows that in the bottom fifth of the income spectrum, there is virtually no dispersion for the middle 50% in each income group – their ATRs are all about zero. The dispersion is widest in the fifth income decile, with the middle 50% paying between 5% and 20% of their income in taxes. Dispersion for the middle 90% is wider, and generally about 25 percentage points throughout the income spectrum, though it is wider for the bottom 10% and the top 1%.

Turning to Chart 9, in the lowest decile group there has been a considerable increase in the spread of ATRs. This is the case in moving from SQ84 to SQ88 and again in moving to

PR88. Otherwise the two sets of tax changes have had a minimal impact on the dispersion of ATRs.

Some dispersion in ATRs within income groups is probably necessary to meet the objective of horizontal equity, for example, to reflect the diversity of family sizes. Still, a range of 25 percentage points is quite wide even for large families versus unattached individuals with the same pre-tax income. Further, Chart 9 suggests no appreciable change in dispersion, so that overall, one cannot conclude that any significant change in horizontal equity has occurred as a result of tax reform.

Marginal Tax Rates

The final and most complex part of the analysis considers how marginal tax rates change at various income levels as one moves through the three tax scenarios. An important goal of tax reform exercise is to reduce the disincentives to work and investment, so that "(t)he reformed tax system will increase incentives to work and invest. Lower tax rates will enable Canadians to keep more of every dollar they earn, to spend or save as they see fit."[6]

Marginal tax rates are often the focus of attention in discussions of incentive effects of the income tax system. If a taxpayer is in a 40% marginal tax bracket, for example, he or she will have available as disposable income only $.60 for every extra dollar of taxable income. The general view is that if marginal tax rates are high, the incentive for individuals to earn more income through work or saving will be diminished.

In practice, the determination of marginal tax rates is very complex. The simple pattern of statutory rates shown in Chart 1 bears little resemblance to the effective marginal tax rates actually experienced by individuals. This is illustrated clearly in the series of charts in this section. The basic reason for much of the complexity, and indeed the perversity, of actual marginal tax rates is the large number of programs and tax provisions which have implicit marginal taxes built into them, and the often subtle ways they interact.

Before launching into this analysis of the impact of tax policy changes on effective marginal income tax rates, an important caveat must be stated – the analysis omits two major programs with very high implicit marginal tax rates. These are social assistance or general welfare, and unemployment insurance. Typically, these programs are subject to 100% marginal tax-back rates – one extra dollar of income results in a one dollar reduction of benefits. The reader should bear in mind, when examining the charts in this section, that none of these instances of very high effective, albeit implicit, marginal income tax rates are being taken into account.

We begin with an examination of the marginal tax rates on wages. In the simulation experiment, the "head" of every family is given a $1,000 increase in wages (irrespective of whether he or she has any wage income to start). The effective marginal tax rate is then defined as one minus the increase in the family's disposable income divided by 1000.[7]

Because family circumstances vary, the most interesting approach is to examine the variations or dispersion in marginal tax rates. These are shown for the SQ84 scenario in Chart 10. This chart is similar in composition to Chart 8 which showed the variation in average tax rates. Within each of the income groups along the horizontal axis, families were sorted in ascending order of their marginal tax rates. Then the cut-off points were found that bracket the middle 50% and the middle 90% of families (that is, 5th, 25th, 75th, and 95th percentiles of marginal tax rates within each income group).

As shown in Chart 10, marginal tax rates (in 1984) for wage incomes range from zero to almost 100% at the lower end of the income spectrum. This range narrows as one moves up the income scale except for the highest 1% of families. At least 5% of families in the bottom half of the income spectrum face a zero marginal tax rate on wage income. For the upper two-thirds of the income spectrum, marginal tax rates rise, but more gradually than one might expect from examining the statutory rate structure in Chart 1.

It is quite difficult to track down precisely all the specific tax and other provisions that explain this observed pattern. Some are discussed below. The main reason for the high marginal rates for some families at the lower end of the income spectrum is the 50% tax-back in the Guaranteed Income Supplement (GIS) and the 75% tax-back in the Spouses' Allowance (SPA) programs for the elderly, and the 50% tax-backs in provincial top-up programs to the GIS, which are "stacked" on top of the GIS and SPA tax-backs. To the extent that individuals in these families are not in the labour force, these high marginal rates would not be of particular concern for policy purposes. For our purposes, this overstatement of the level of marginal tax rates is limited to a small segment of the population and does not appreciably affect overall patterns or the changes between tax policy scenarios.

Chart 11 shows the impacts of the tax policy changes since 1984 on the variability in marginal tax rates on wages as it affects the middle 90% of families in each income group. The basic impression to be drawn from this Chart is that overall variability in the marginal tax rates on wage income has been largely unaffected by changes in tax policy since 1984. In other words, the range of marginal tax rates within each income group is virtually the same under each of the three tax policy scenarios.

Charts 12.1 to 12.3 focus on the marginal tax rate changes at the individual family level due to the various tax policy changes. Even though Chart 11 paints a picture of overall stability, these charts show that there has been some degree of "churning" in the marginal tax rates faced by particular families. For example, Chart 12.1 indicates that in the bottom half of the income spectrum, 5% of families faced increases in marginal tax rates of about 20 percentage points or more. This could be due to a mixture of the abolition of the $200 basic federal tax reduction, the 5% tax-back on the new refundable sales tax credit, and the partial de-indexing pushing families into higher tax brackets.

Another observation in Chart 12.1 is the small reduction in marginal tax rates for 5% of families in the upper half of the income spectrum. This may, in part, be due to the lowering of the income threshold at which the child tax credit begins to be phased out. In part, it may also reflect the $500,000 lifetime capital gains exclusion introduced in 1985. This interesting interaction could occur if the capital gains exclusion lowered taxable incomes sufficiently to

drop some families into a lower tax rate bracket, thereby lowering their marginal tax rate on wage income as well.

Chart 12.2 suggests that about half of all families in all but the bottom fifth of the income spectrum can expect to face an increase in marginal tax rates on wage income under PR88 compared to SQ88. This result certainly appears inconsistent with the statutory rate changes shown in Chart 1. There may be several factors in the explanation, however. The definition of taxable income is substantially changed by the reform proposals – the exemptions and deductions converted to credits are no longer deducted from total income to compute taxable income. Thus the same total income will place some taxpayers in a higher tax bracket than before, even though the higher tax is subsequently offset by the new tax credits. Similarly, the base broadening measures will tend to produce a higher increase in taxable income for a given increase in wage income. Of particular importance in accounting for these increased MTRs for those families whose head had no wage income, is the abolition of the $500 standard employment expense deduction. Chart 12.3 shows the combined effect of the tax changes covered in Charts 12.1 and 12.2.

Chart 13 begins a similar examination of marginal tax rates on interest income. The main difference between the treatment of wage income and interest income in 1984 is the $1,000 investment income deduction, which is being abolished as part of the base broadening provisions of the tax reform. This deduction, plus the fact that a large proportion of families have no interest income, probably accounts for the large number of families throughout the income spectrum who, in 1984, faced essentially a zero marginal tax rate on interest income. The very high marginal tax rates faced by a smaller fraction of families at the lower end of the income spectrum is again likely accounted for by the tax-backs in GIS, SPA and the provincial top-ups for the elderly.

Chart 14 shows some narrowing in the range of marginal tax rates on interest income in the upper half of the income scale. The small change from SQ84 to SQ88 is probably due to the decline in the real value of the $1000 investment income deduction which was not indexed. The larger narrowing from SQ88 to PR88 is due to the abolition of this provision.

Chart 15.1 has a similar pattern to the corresponding chart for wage income (Chart 12.1), except at the top of the income spectrum where a few families experience a larger drop in marginal rates. The large increase in marginal rates on interest income in Chart 15.2 (which compares PR88 to SQ88) for most families throughout the income spectrum is due to the abolition of the $1000 investment income deduction. Chart 15.3 displays the combined effects in the previous two charts.

Chart 16 begins the examination of marginal tax rates on dividends. The most striking observation here is that over half of all families in the middle to upper portion of the income spectrum faced a negative marginal tax rate on dividends in 1984. The reason is that for these families, the extra dividend income did not generate any additional taxable income because it was sheltered by the $1000 investment income deduction. However, at the same time, the extra dividend income did generate a dividend tax credit for the taxpayers.

The bottom set of curves in Chart 17 shows that these negative marginal tax rates first declined from SQ84 to SQ88, and then virtually disappeared with tax reform (PR88). The

reason for these shifts is the decline in the magnitude of the dividend tax credit and the abolition of the $1000 investment income deduction in tax reform. The reduction of the dividend tax credit and the associated dividend gross-up also account for the increased marginal tax rate at the 95th percentile cut-off in the top half of the income spectrum. The marginal tax rates for some families in the lower portion of the income scale exceed 100%. This is the result of the interaction of the dividend gross-up provision and the tax-backs in the GIS, SPA, and provincial top-ups for the elderly referred to earlier.

Charts 18.1 and 18.2 reflect the same interactions discussed above. In Chart 18.1, the increase in marginal rates between SQ84 and SQ88 reflects the reduction in the dividend tax credit provision and the erosion of the investment income deduction due to inflation. The further increase in moving to PR88 (Chart 18.2) reflects the abolition of the investment tax credit. Again Chart 18.3 incorporates the combined impacts of the previous two charts.

The next group of charts examines changes in the marginal tax rates on capital gains. Chart 19 presents the picture for 1984. In all income groups there were some families with marginal tax rates of zero reflecting the $1,000 investment income deduction. Chart 20 shows that the dispersion in MTRs narrows considerably with the moves to SQ88 and PR88. Virtually all of the reduced dispersion is a reduction in the 95th percentile MTR within each income group. Between SQ84 and SQ88 the major change in capital gains taxation was the introduction in 1985 of the $500,000 lifetime exemption (in addition to the capital gains exemption which has always existed on the sale of a family's principal residence and the capital gains rollovers for family farms and small businesses). This change is reflected in Chart 21.1, which is virtually a mirror-image of the previous chart. The effect of the $500,000 lifetime exemption was effectively to eliminate capital gains taxation in Canada for the near term except for a tiny fraction of the highest income earners. (Of course, since this is a lifetime exemption, it can be expected that over time, as individuals use up their exemptions, effective marginal tax rates on capital gains will rise.)

The results in Chart 21.2 are perhaps more surprising. The tax reform reduced the lifetime exemption to $100,000 and increased the inclusion rate from 50% to 75%. Yet Chart 21.2 shows that, except for a portion of the top 1% of income earners, there were no increases in marginal tax rates on capital gains compared to SQ88. This result reflects that (principal residences, small businesses, farms, etc. aside) virtually no-one has realized capital gains in excess of $100,000 in 1984; the segment of the top 1% group is the only noticeable exception. It should be noted that this result does not recognize that in the 1985-87 period some taxpayers will have used up a portion of their lifetime exemptions. Nevertheless, it is still the case that for most families, capital gains taxation has been virtually eliminated over the near term, even after tax reform. Chart 21.3, presents the combined impacts of the earlier two charts.

Charts 22.1 to 22.4 bring together the results on MTRs for each of the four sources of income. Charts 22.1 and 22.3 refer to SQ84, while 22.2 and 22.4 refer to PR88. Charts 22.1 and 22.2 show the 50th percentile or median MTRs within each income group for each source of income. Charts 22.3 and 22.4 show the 75th percentile or third quartile MTRs.

Comparing Charts 22.1 and 22.2, it appears that the tax changes over the 1984 to 1988 period have narrowed the range of effective median MTRs. This is mainly due to the

elimination of the negative MTRs on dividends. However, the narrowing of MTRs by income source is much less apparent in examining the third quartile MTRs in Charts 22.3 and 22.4.

Perhaps most surprising in this set of charts is the rather flat pattern of median and third quartile MTRs across income groups. Notwithstanding the overall progressivity in terms of average tax rates, the tax system exhibits a considerable "flat tax" structure in terms of marginal rates.[8]

Finally, these charts show clearly that "middle class" sources of income – wages, and interest – post-reform are more highly taxed at the margin than "upper class" sources of income – dividends and capital gains. Incomes at the low end of the spectrum are even more highly taxed, but this is apparent in the charts only for GIS and provincial top-ups because the underlying simulations do not take into account social assistance.[9]

Summary and Highlights

- Abstracting from economic growth, personal income tax increases between 1984 and SQ88 (status quo 1988) reduce disposable incomes by an aggregate of $6.5 billion (1984 dollars) or 2.7%. Tax decreases in the 1988 reform result in overall disposable incomes being $3.4 billion less than in 1984, a reduction of 1.4%. On average, these respective declines amount to $650 and $340 per family.

- Overall, the personal income tax is progressive and remains so throughout the 1984 to 1988 period. During that time, effective average tax rates decline for the lowest 20% of families between 1984 and SQ88, and for the lowest 30% between 1984 and PR88 (post-reform 1988). The top 1% of families experience an increase in average tax rates between 1984 and SQ88, but an even larger decrease in moving to PR88. Over the entire period, tax changes are progressive for the lowest 80% of families (up to about $43,000 in income in 1984) and regressive for the upper 20%.

- Comparing the post-reform system to SQ88, virtually all families benefit. When 1984 is used as the basis of comparison, gainers outnumber losers in the bottom 30% of the population and in the top 1%. For all other income groups, the number of losers dominates the number of gainers by large margins.

- Considerable variation in average tax rates is evident across family types. The lowest 17% of the family allowance population have negative average tax rates in 1984 and they experience gains in moving to SQ88 and again in moving to the post-reform scenario. These gains reflect the enrichment of the Refundable Child Tax Credit and the introduction and later enrichment of the Refundable Sales Tax Credit. The remainder of the family allowance population experience tax increases between 1984 and SQ88; they then become gainers in moving to PR88. The post-reform tax decreases (compared to SQ88) are distributionally neutral for this group, except for the top 1% whose gains are large enough to outweigh the earlier increases.

Over 80% of the Old Age Security (OAS) population are gainers in tax reform compared to both SQ84 and SQ88. The OAS population in the top 1% of the overall population is also better off. The sales tax credit and the switch from deductions and exemptions to credits appear to account for these gains.

In moving from 1984 through the post-reform scenario the bottom 10% and the top 1% of the remaining population group (OTHER) either remain unaffected or gain, while the rest of this group experience tax increases at fairly uniform rates.

- With respect to horizontal equity, there is a considerable amount of variation in average income tax rates of families at all points in the income spectrum. The range is about 25 percentage points for the middle 90% of families at a given income level. This variation was not appreciably altered by tax changes over the 1984-88 period.

- Effective marginal tax rates are determined in complex ways that involve the interaction of various tax measures alongside direct spending programs which have their own (often implicit) tax-back provisions. As a result, in 1984, marginal tax rates faced by families at a given income level can vary greatly and, in some cases, marginal rates at lower incomes are greater than at higher incomes.

  Interesting examples of these interactions include:

  - the capital gains exclusion drops some families into lower tax brackets, thereby lowering their marginal tax rates on other forms of income as well;

  - families claiming less than the full amount of the $1,000 investment income deduction, could still claim the dividend tax credit, resulting in a negative marginal tax rate on dividends; and

  - the operation of the Guaranteed Income Supplement and the Spouses' Allowance programs for the elderly, in combination with provincial top-up programs, results in very high marginal tax rates for some families, and for some forms of income these marginal rates exceed 100%.

As a result of the tax reform provisions, similar numbers of families throughout the income spectrum face increases in marginal tax rates as face decreases. The reform has some effect in narrowing the dispersion in marginal tax rates among different income sources, but marginal tax rates on wages and interest incomes are still at least twice as high as those on dividends and capital gains.

Notes

1. The computer model used in this analysis, the SPSD/M is a "beta test" version. It has been distributed to a number of users on a trial basis. As with any new and complex piece of computer software, it may contain "bugs". The purpose of "beta testing" is to use the software in a realistic setting, both to produce useful output, and to assess its quality. Many checks have been made of the plausibility and reasonableness of the results presented in this paper. Nevertheless, the reader is cautioned that there still may be some errors, though hopefully only small ones. Furthermore, the reader is encouraged to concentrate on broader patterns of results rather than on specific numerical results, since the former are more reliable.

   After the beta testing phase is complete, the SPSD/M will be available for purchase from Statistics Canada by anyone. Thus, any reader with the interest, ability and a personal computer will be able to reproduce the results presented here, and to develop his or her own analysis. It is hoped that this will contribute to an increase in the quality of the public debate on matters of such great general interest as tax reform.

   For information on the construction of the database and model see M. Wolfson, et. al., "The Social Policy Simulation Database. An Example of Survey and Administrative Data Integration" (Ottawa: Statistics Canada, 1988), presented at the NBER 50th Annual Conference on Income and Wealth, Washington, D.C., May 1988. Details of sample sizes by income group and family type are shown in Appendix Table 1.

2. Table 1 indicates the four measures in the June White Paper that are not included in the simulations because data to support the modelling of these more technical provisions are not available in sufficient detail. The federal revenue impacts of these measures in 1988 as presented in the White Paper total $540 million. When adjusted to 1984 values (to be comparable to the other dollar values in the analysis) these measures amount to about $440 million.

   Several further amendments to the White Paper proposals were announced by the Minister of Finance when introducing the tax reform legislation in December 1987. These included small adjustments to the new medical expense credit, the CPP and UI premium credits, an increase in the credit for the third and subsequent dependent children and an increase in the ceiling for dependent earnings without affecting the allowable credit, and a $35 per child increase over the White Paper proposal in the Refundable Child Tax Credit. See Table 1. The federal revenue cost of these amendments was estimated to be $50 million annually ($40 million in 1984 dollars). These amounts should be compared to the $2.2 billion federal revenue cost of the June 1987 White Paper reforms that are captured in the analysis.

   In December 1987 child care proposals were also introduced which included certain tax measures. While they are not part of the tax reform package, per se, and have not been included in the simulations, they are worthy of note. The tax measures proposed included an increase in the refundable child tax credit of $100 for children under the age of six in 1988, and $200 in 1989 and thereafter. The $2,000 child care expense deduction was raised to $4,000 and the limit of $8,000 per family was removed.

3. Average tax rates in this analysis are defined as the ratio of total income taxes paid (including UI and CPP/QPP payroll taxes) to total pre-tax income. This, in turn, is equal to one minus the ratio of disposable to total income. Total income includes market incomes from all sources plus transfers (eg., Family Allowance, UI, pensions) from

government. It does not include imputed income (eg., from owner-occupied homes) and income in kind that are usually excluded from measures of money income. Capital gains from the sale of principle residences are also excluded, as they are in most such definitions, including the analysis in the Department of Finance White Paper.

4. One would expect that the distributional impacts of the reform measures excluded from the simulations (see Table 1) would not be neutral. Specifically, the provisions pertaining to business expenses, write-offs (films, MURBs and earned depletion) and RRSP contributions are likely to affect the top 1% of the population more than proportionately. Therefore, our estimates of gains accruing to the top 1% may be overstated. To consider the maximum sensitivity of the top 1% result to these omissions, we make the following extreme assumptions: suppose 40% of the business expense measure ($230 million total revenue impact), 50% of the write-off restrictions ($50 million total), and 10% of the RRSP measure ($200 million total) affect the top 1%. Converting these amounts to 1984 values and making allowance for provincial income taxes, the overall disposable incomes of the top 1% would be about $168 million less in PR88 than the simulation results indicate.

   Per family, the gains would still be greater than half those indicated in the text, placing the top 1% group second to the first decile in terms of percentage gains, but still leaving the top 1% group with the largest dollar gains.

   It should be noted, however, that this sensitivity adjustment represents the extreme – the maximum error that these excluded items could introduce. The actual impacts of these measures on the top 1% percentile group is less. In addition, while this sensitivity test includes the slower phase-in of higher RRSP contribution limits, the benefits to the top 1% of the increased limits themselves are not included in the analysis.

5. It may be noted that the positive ATRs for OAS families compared to negative ATRs for FA families at the low end of the income spectrum is, in some sense, arbitrary. The reason is the classification of the GIS as a direct spending program, and hence not part of the tax system, while the refundable child tax credit – which is very similar in structure to the GIS – is part of the tax system. A more integrated view of the tax/transfer system would treat GIS and the child tax credit more uniformly. If this were done, ATRs for OAS families would also be negative at the low end of the income spectrum.

6. The White Paper, p. 2.

7. This experiment does not capture the effects of changing the marital exemption to a tax credit. This change means that, for example, a spouse entering the labour force will face a lower MTR after tax reform. The focus of the analysis in this paper is on MTRs facing "heads" of households.

8. It is, of course, mathematically possible to have flat marginal tax rates and progressive average tax rates. See Michael Wolfson, "A Guaranteed Income" *Policy Options* Volume 7, Number 1 (January/February 1986): 35-45.

9. Neither has the impact of extra income on UI benefits been simulated. While the model can analyze such impacts on the UI program, this analysis is quite complex and has been omitted here.

Table 1

Summary of Tax Policy Changes

1. **1984 Law to 1988 Status Quo**

- CPI-3 partial de-indexing of exemptions, tax brackets, and Family Allowances
- abolition of $200 basic federal tax cut[1]
- retargetting of child tax credit
- introduction of $50 refundable sales tax credit
- introduction of $500,000 lifetime capital gains exemption
- reduction in dividend gross up and tax credit
- introduction of alternate minimum tax
- introduction of 3 per cent surtax

2. **1988 Status Quo to 1988 Reform (as per June 1987 White Paper)**

A. *Base Broadening*

- cut in lifetime capital gains exemption to $100,000 and increase in inclusion rate from 50 per cent to 75 per cent (in 1990)
- further reduction in dividend gross up and tax credit
- abolition of $1,000 investment income deduction
- abolition of $500 standard employment expense deduction
- * tightening of auto, business meal and home office expenses
- * restriction of write-offs on films, MURBs, and earned depletion
- * slower phase-in of enlarged RRSP contribution limits
- * abolition of forward and block averaging

B. *Rate Restructuring and Tax Credits*

- collapse 10 tax brackets to three and lower marginal tax rates
- enrich refundable sales tax credit

C. *Conversion to Tax Credits*

- personal exemptions (basic, spousal, children, aged, disability)
- itemized deductions (charity, medical expenses)
- payroll tax deductions (Canada/Quebec Pension Plans, unemployment insurance)
- education deductions (tuition fees, monthly amount)

3. **December 1987 Amendments**

- * increase refundable child tax credit by $35 per year
- * increase non-refundable child tax credit for third and subsequent children

---

* not included in simulation; see text note number 2.

1. This change was actually introduced in the 1983 budget. It began with the phasing out of the tax reduction for higher income individuals in 1984 ($256 million initial revenue impact in 1984) and for all taxpayers beginning in 1985.

Table 2

Summary of Aggregate Effects of Income Tax and Transfer Program Changes (1984 $ billions)

Income or Tax Item	1984 Status Quo	1988 Status Quo	Change 1984 to 1988	Tax Transfer Scenario: 1988 Post Reform	Change due to Reform	Combined Change
Market Income (employment, investment, other)	253.0	253.0	--	253.0	--	--
PLUS						
Transfer						
Family Allowance (fed)	2.3	2.1	-0.2	2.1	--	-0.2
OAS	7.6	7.6	--	7.6	--	--
GIS	3.7	3.7	--	3.7	--	--
Others (e.g. UI, CAP)	22.1	22.0	-0.1	22.0	--	-0.1
EQUALS						
Total Income	288.7	288.5	-0.2	288.5	--	-0.2
MINUS						
Taxes						
Federal Income Tax	25.8	30.7	4.9	28.5	-2.2	2.7
Provincial Income Tax	18.4	19.4	1.0	18.6	-0.8	0.2
UI Premiums	3.4	3.7	0.3	3.7	--	0.3
C/QPP Premiums	2.6	2.7	0.1	2.7	--	0.1
EQUALS						
Disposable Income	238.4	231.9	-6.5	235.0	3.1	-3.4

Table 3

Changes in Effective Tax Rates and Disposable Income
SQ84, SQ88 and PR88

Total Income Group ($)	% of All Families	Average Total Income ($-1984)	Average Effective Tax Rates(1)			Average Change in Disposable Income ($)			Average Change in Disposable Income (%)		
			SQ84 %	SQ88 %	PR88 %	SQ88-SQ84	PR88-SQ88	PR88-SQ84	SQ88-SQ84	PR88-SQ88	PR88-SQ84
0 - 6,660	10	3,700	-2.8	-4.6	-5.4	60	30	90	1.5	0.8	2.3
6,660 - 9,010	10	7,740	-0.8	-1.1	-1.6	10	40	50	0.1	0.5	0.6
9,010 - 12,940	10	10,910	2.0	2.8	1.7	-100	120	20	-1.0	1.1	0.2
12,940 - 17,230	10	14,940	5.4	7.2	5.8	-290	200	-80	-2.0	1.5	-0.6
17,230 - 22,750	10	19,890	10.0	12.5	10.9	-520	320	-210	-2.9	1.8	-1.2
22,750 - 28,930	10	25,830	13.1	16.0	14.5	-760	360	-390	-3.4	1.7	-1.7
28,930 - 35,630	10	32,210	16.2	19.2	18.2	-970	300	-680	-3.6	1.1	-2.5
35,630 - 43,350	10	39,290	18.6	21.4	20.7	-1110	270	-840	-3.5	0.9	-2.6
43,350 - 56,340	10	49,200	20.3	22.9	22.1	-1260	380	-890	-3.2	1.0	-2.3
56,340 - 70,260	5	62,340	22.1	24.4	23.6	-1480	500	-980	-3.0	1.1	-2.0
70,260 - 117,080	4	84,370	24.4	26.4	25.5	-1710	820	-890	-2.7	1.3	-1.4
117,080 & over	1	194,180	32.5	33.1	30.6	-1160	4730	3570	-0.9	3.6	2.7
All families	100	28,810	17.4	19.6	18.6	-650	310	-340	-2.7	1.3	-1.4

Notes:

(1) Includes federal and provincial PIT, UI premiums, and CPP/QPP premiums.

Table 4

Distribution of Family Type Subgroups by Percentile Income Group

Percentile Income Group (%)	Income Range ($)	(Percentages) Family Type Subgroup FA	OAS	Other	Total Population
0-10	0 - 6660	5	6	16	10
10-20	6660 - 9010	5	26	6	10
20-30	9010 - 12940	7	17	9	10
30-40	12940 - 17230	7	18	9	10
40-50	17230 - 22750	9	10	11	10
50-60	22750 - 28930	12	6	10	10
60-70	28930 - 35630	13	5	10	10
70-80	35630 - 43350	15	4	9	10
80-90	43350 - 56340	14	4	9	10
90-95	56340 - 70260	7	2	5	5
95-99	70260 - 117080	5	2	4	4
99-100	117080 & over	1	1	1	1
	Total (%)	100	100	100	100
	Total (Millions of Families)	3.7	2.0	4.3	10.0
	Average Income ($000)	35.0	19.7	27.5	28.8

Note:

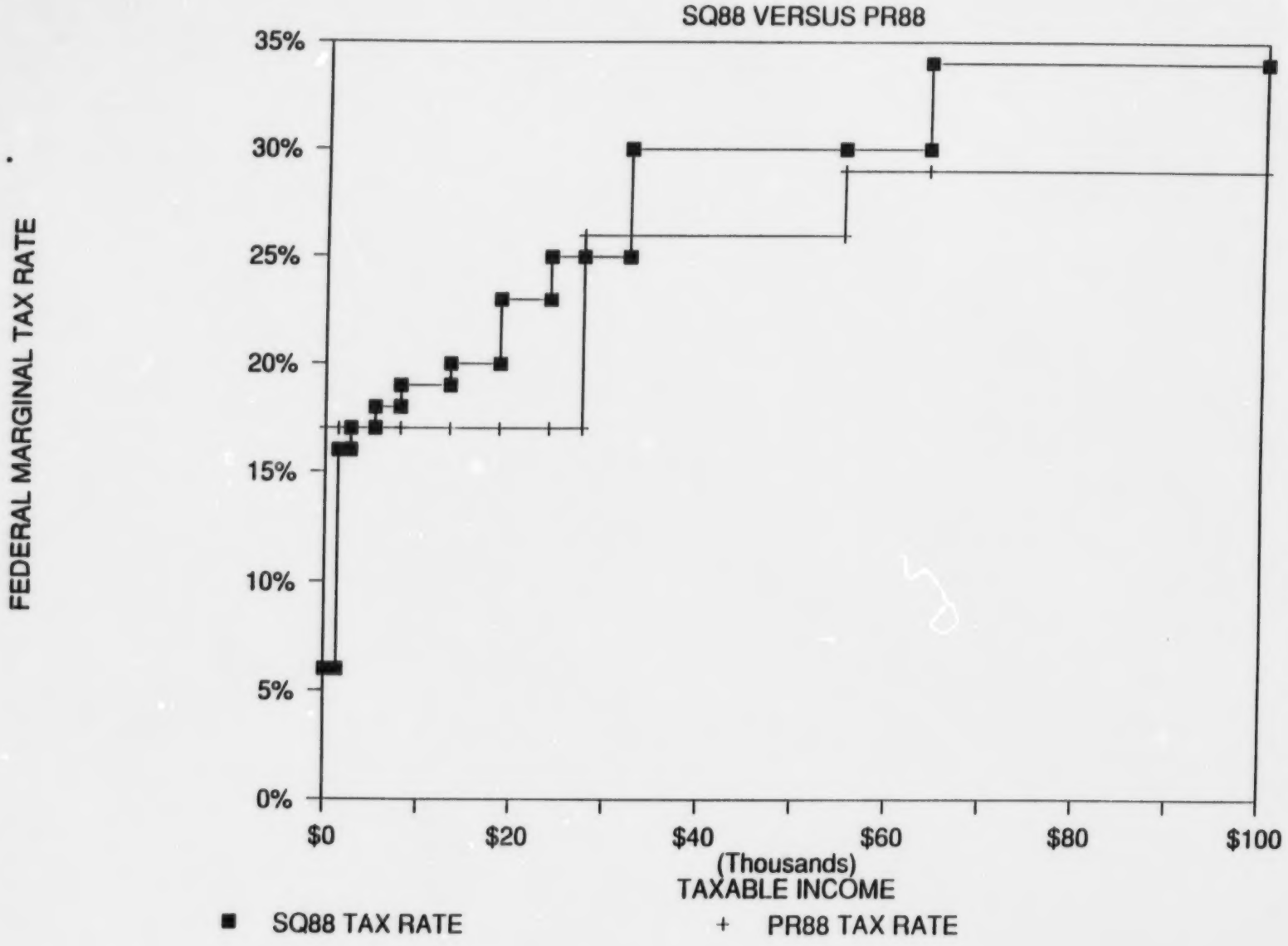
Percentages may not add to 100 due to rounding.

Table 5

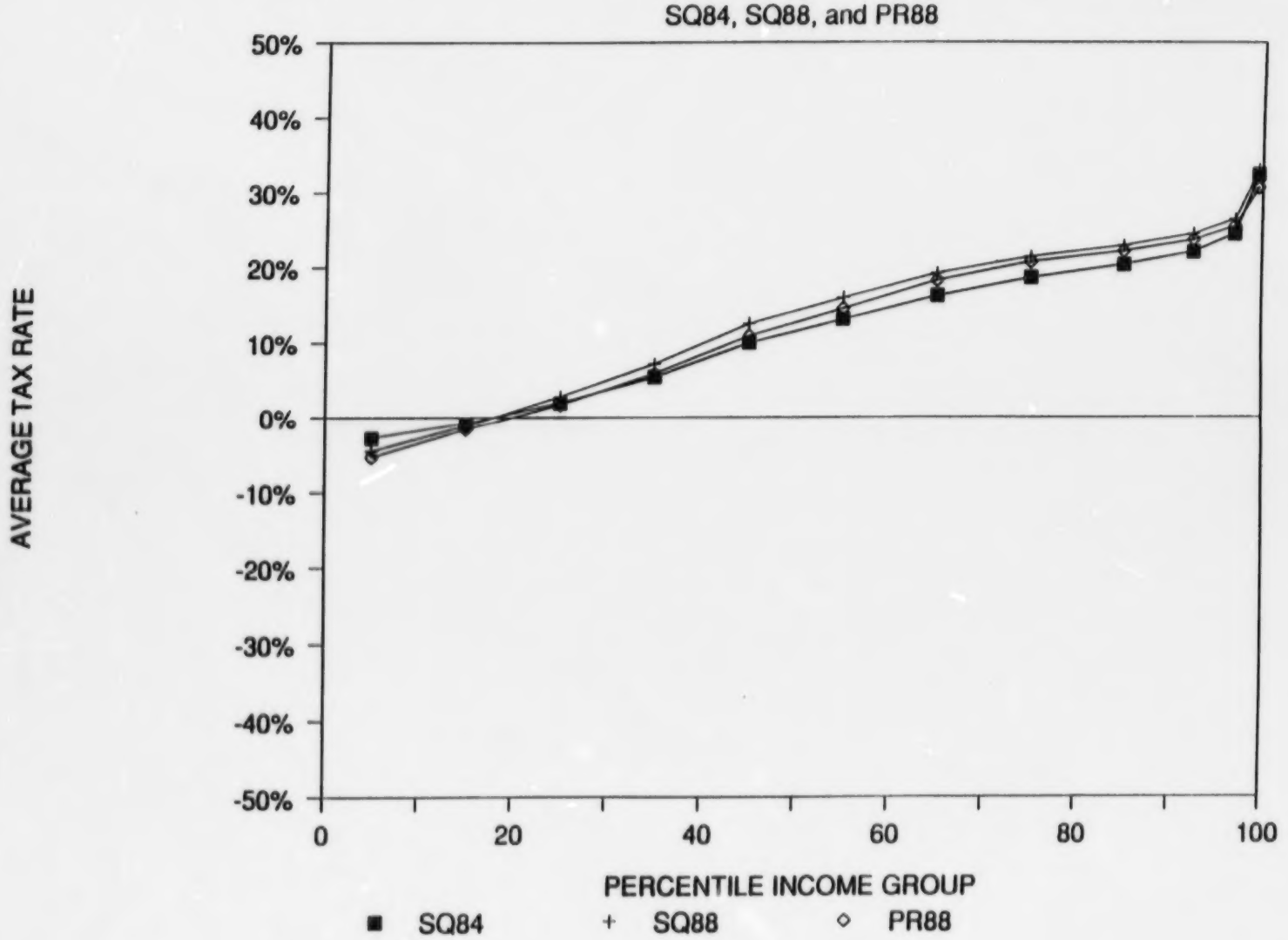
Average Tax Rate Ranges
Selected Income Groups

	SQ84	SQ88	PR88
First Decile			
lowest 5% ATRs	-30.3	-43.8	-49.8
lowest 25% ATRs	-0.8	-7.1	-8.2
median	0.0	-1.0	-1.5
lowest 75% ATRs	0.0	-0.6	-0.9
lowest 95% ATRs	3.1	3.3	2.1
Fifth Decile			
lowest 5%	-1.0	-0.2	-1.0
lowest 25%	3.6	6.8	4.7
median	9.7	12.7	11.0
lowest 75%	16.3	18.9	17.5
lowest 95%	21.7	24.1	22.3
Eighth Decile			
lowest 5%	9.0	11.7	10.4
lowest 25%	15.4	18.4	17.5
median	18.9	21.8	21.0
lowest 75%	22.0	24.9	24.5
lowest 95%	26.6	29.1	28.7
95th Percentile			
lowest 5%	13.0	15.2	14.4
lowest 25%	19.0	21.5	20.9
median	22.3	24.7	23.9
lowest 75%	25.2	27.7	26.8
lowest 95%	30.3	32.5	31.8
Top Percentile			
lowest 5%	15.0	11.6	14.7
lowest 25%	24.7	26.4	22.1
median	31.4	32.9	30.7
lowest 75%	37.2	38.7	29.1
lowest 95%	45.1	45.2	34.9

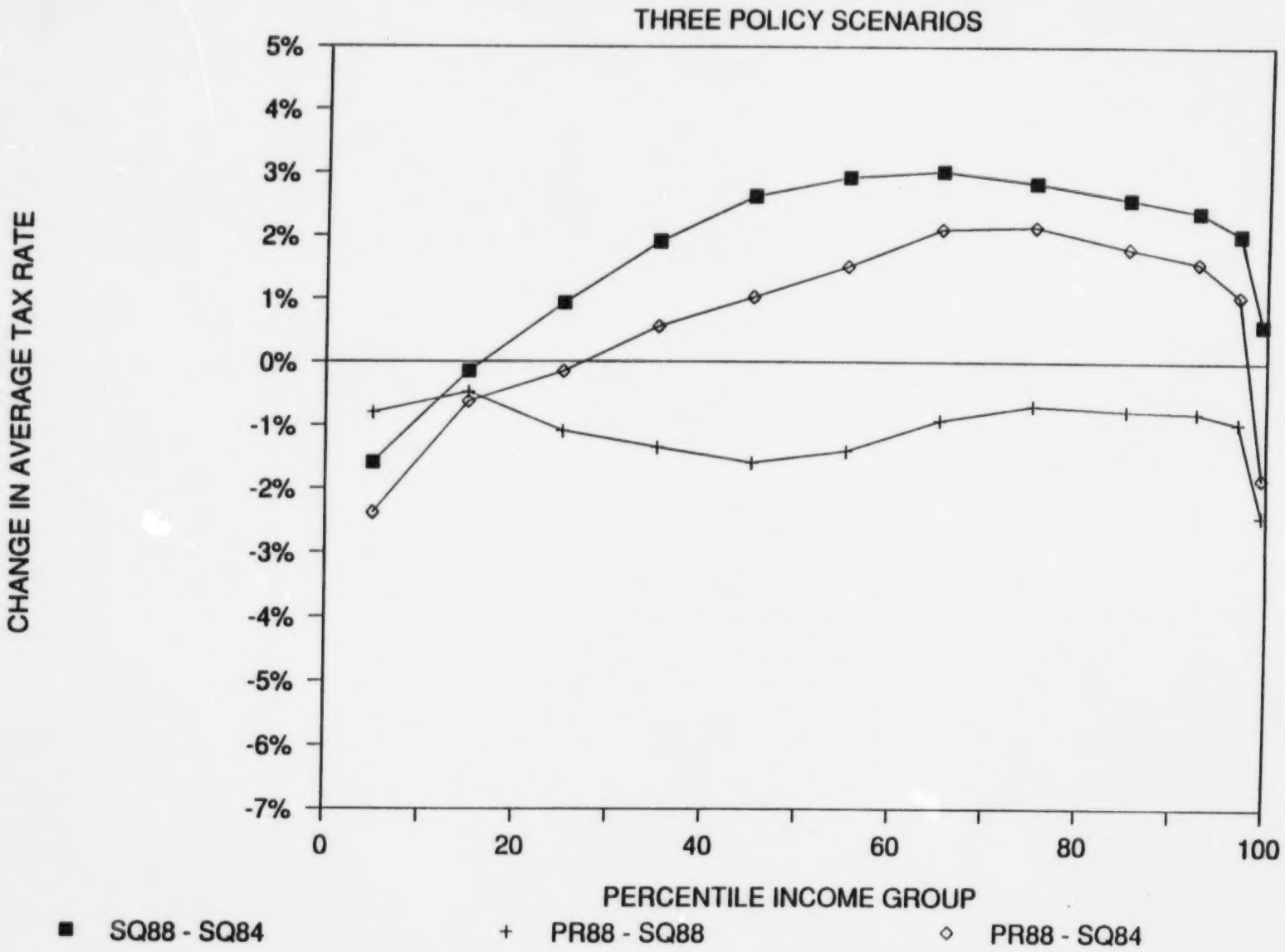
1. FEDERAL MARGINAL TAX RATE COMPARISON



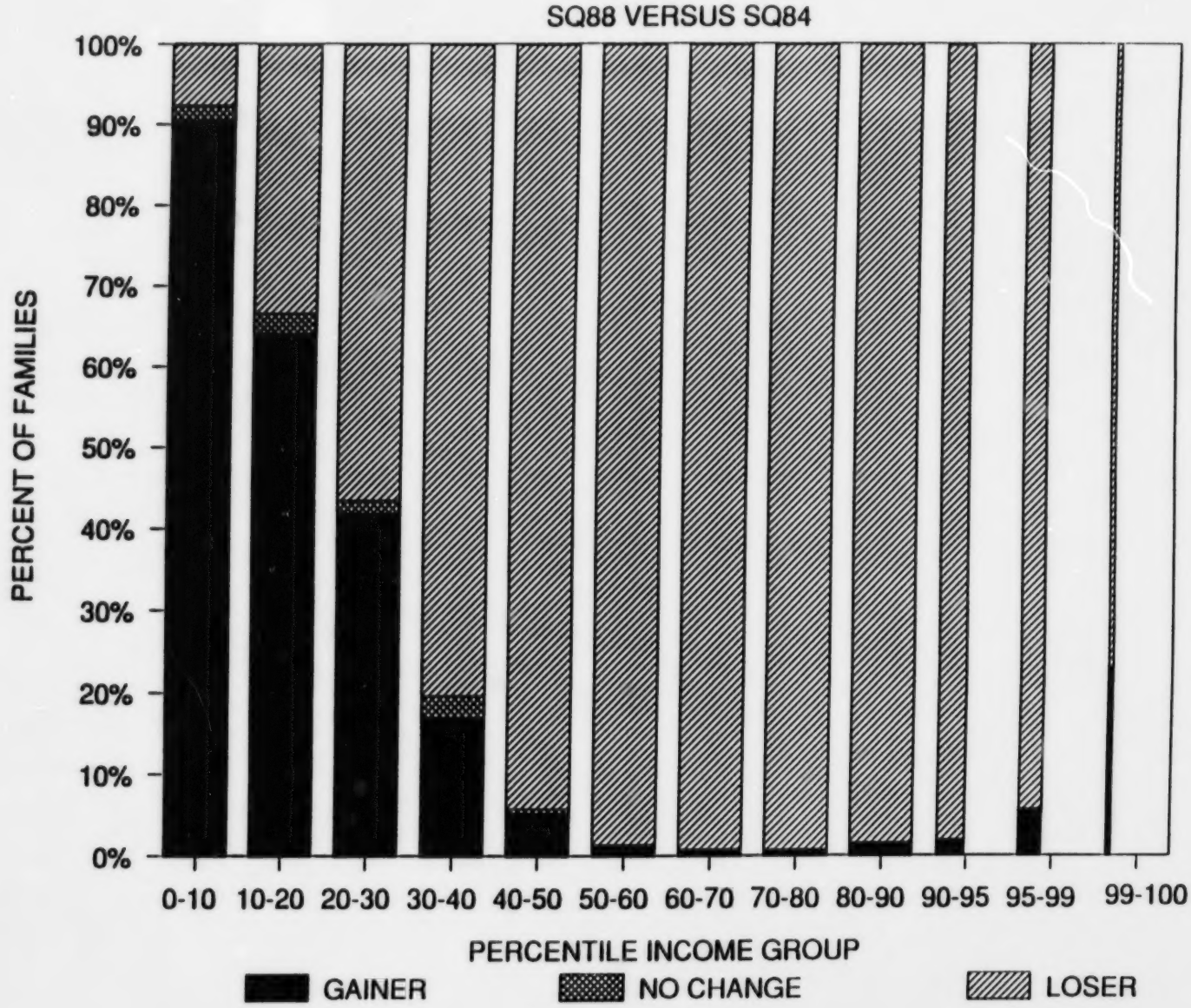
2. AVERAGE TAX RATES BY PERCENTILE INCOME GROUP



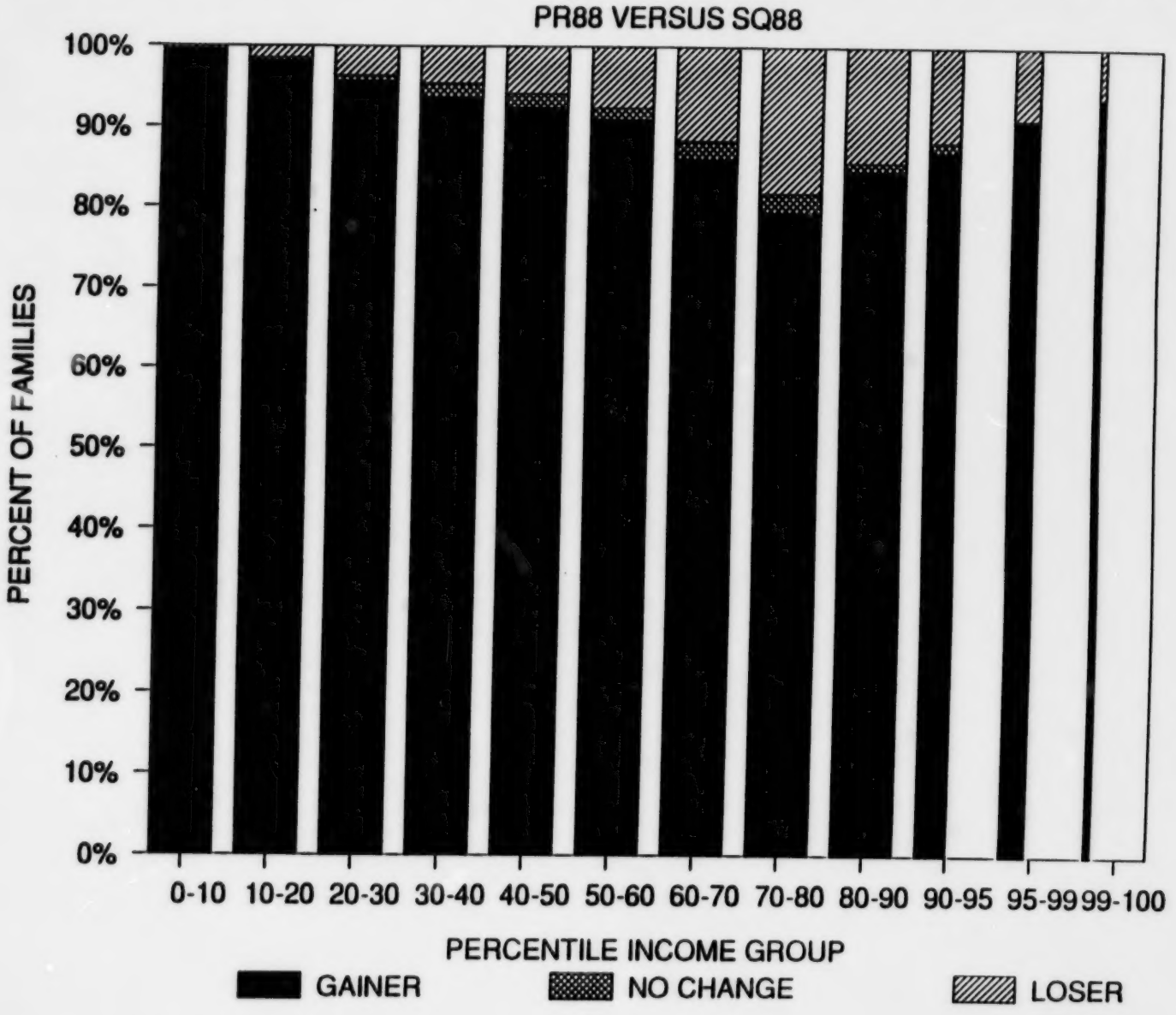
3. CHANGE IN AVERAGE INCOME TAX RATES



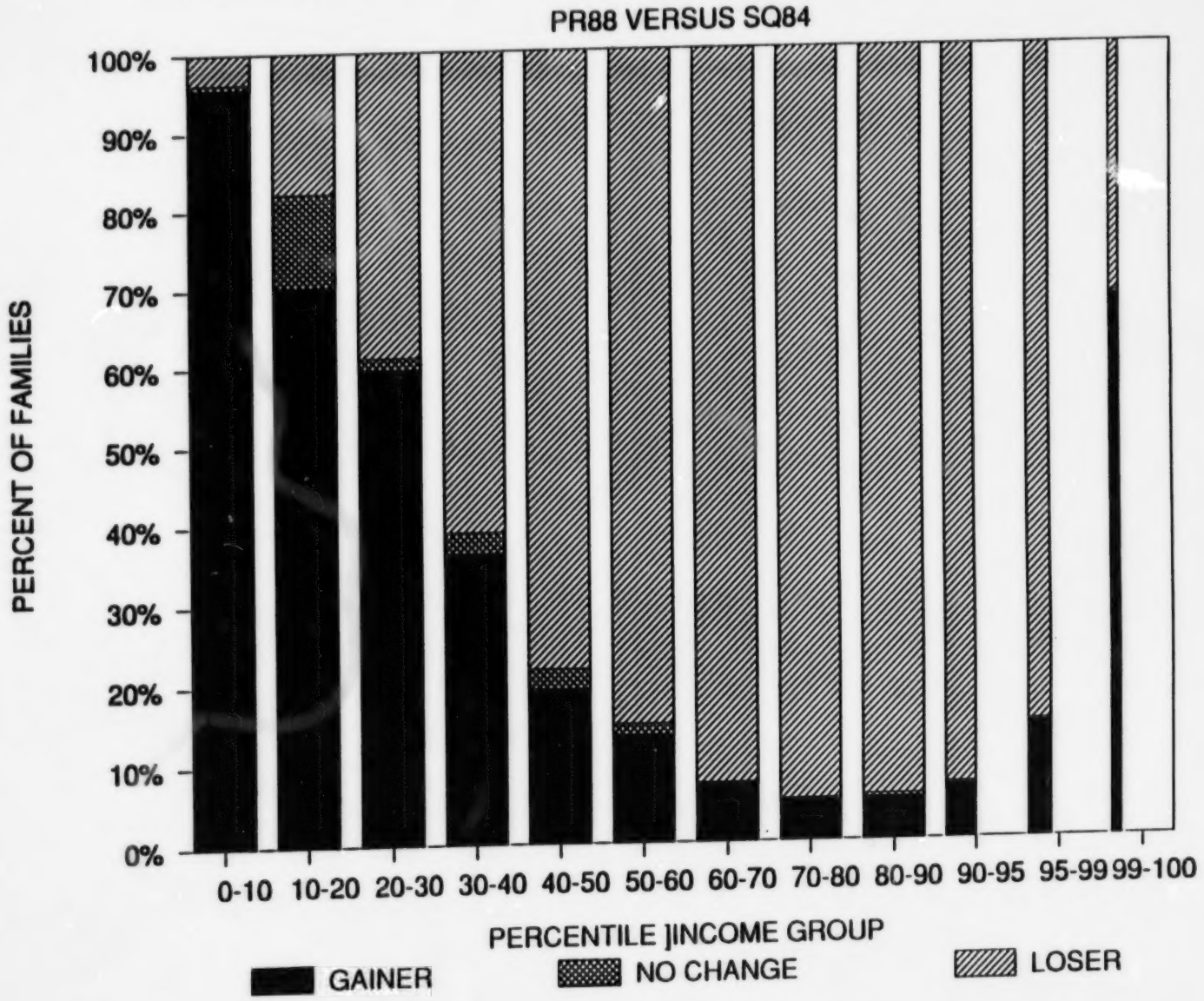
4.1 DISTRIBUTION OF GAINERS AND LOSERS (%)



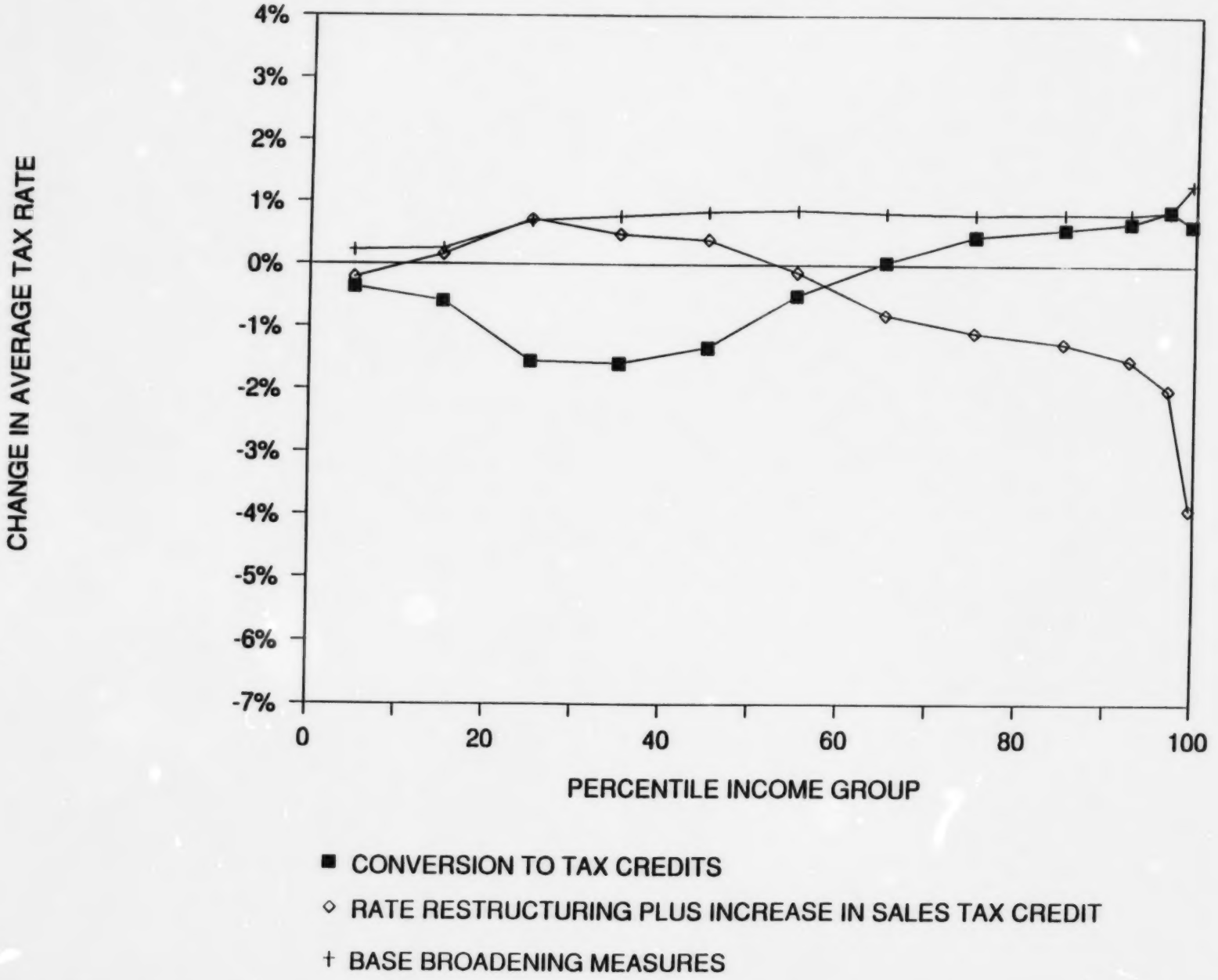
4.2 DISTRIBUTION OF GAINERS AND LOSERS (%)



4.3 DISTRIBUTION OF GAINERS AND LOSERS (%)

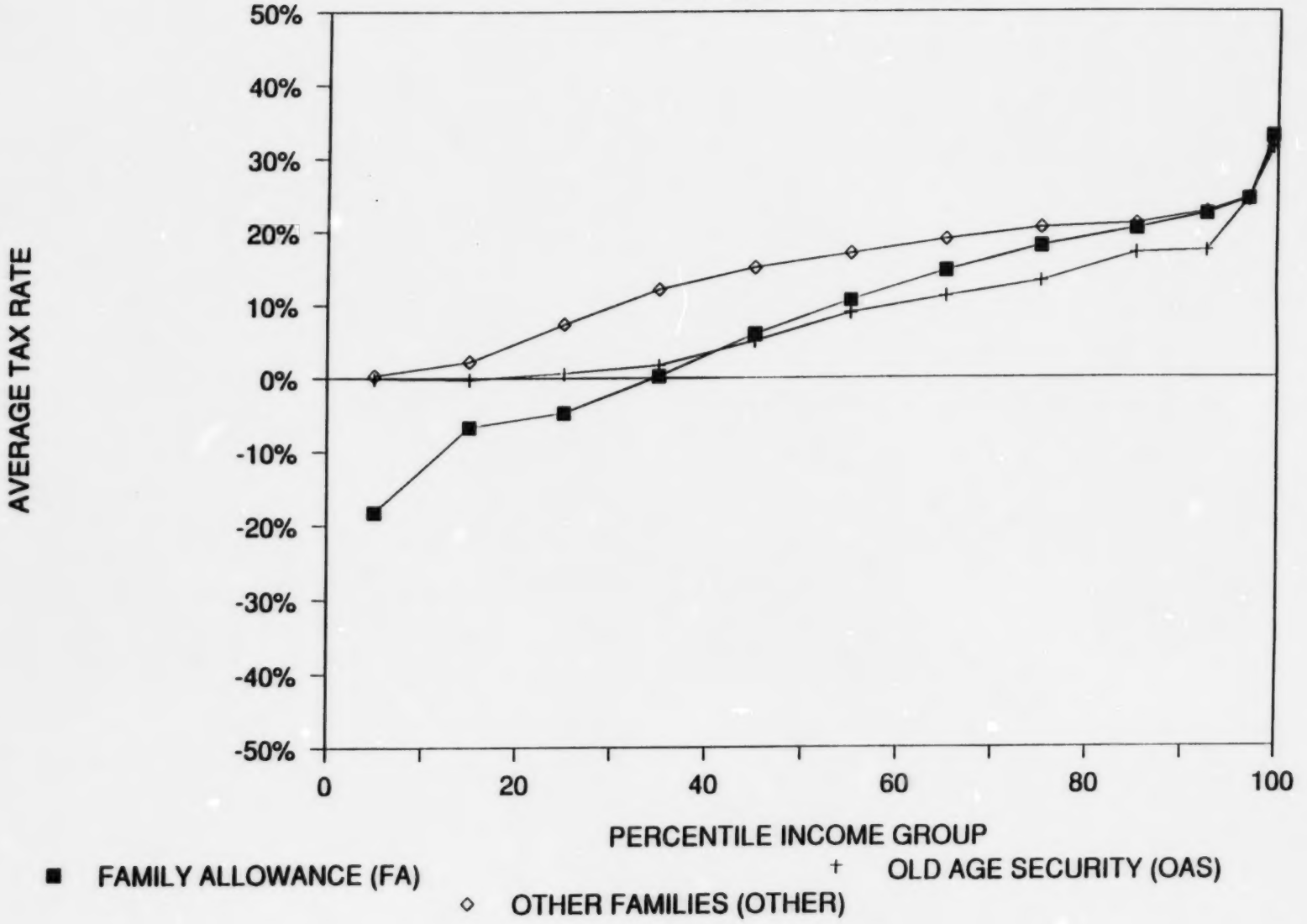


5. DECOMPOSITION OF TAX REFORM IMPACTS

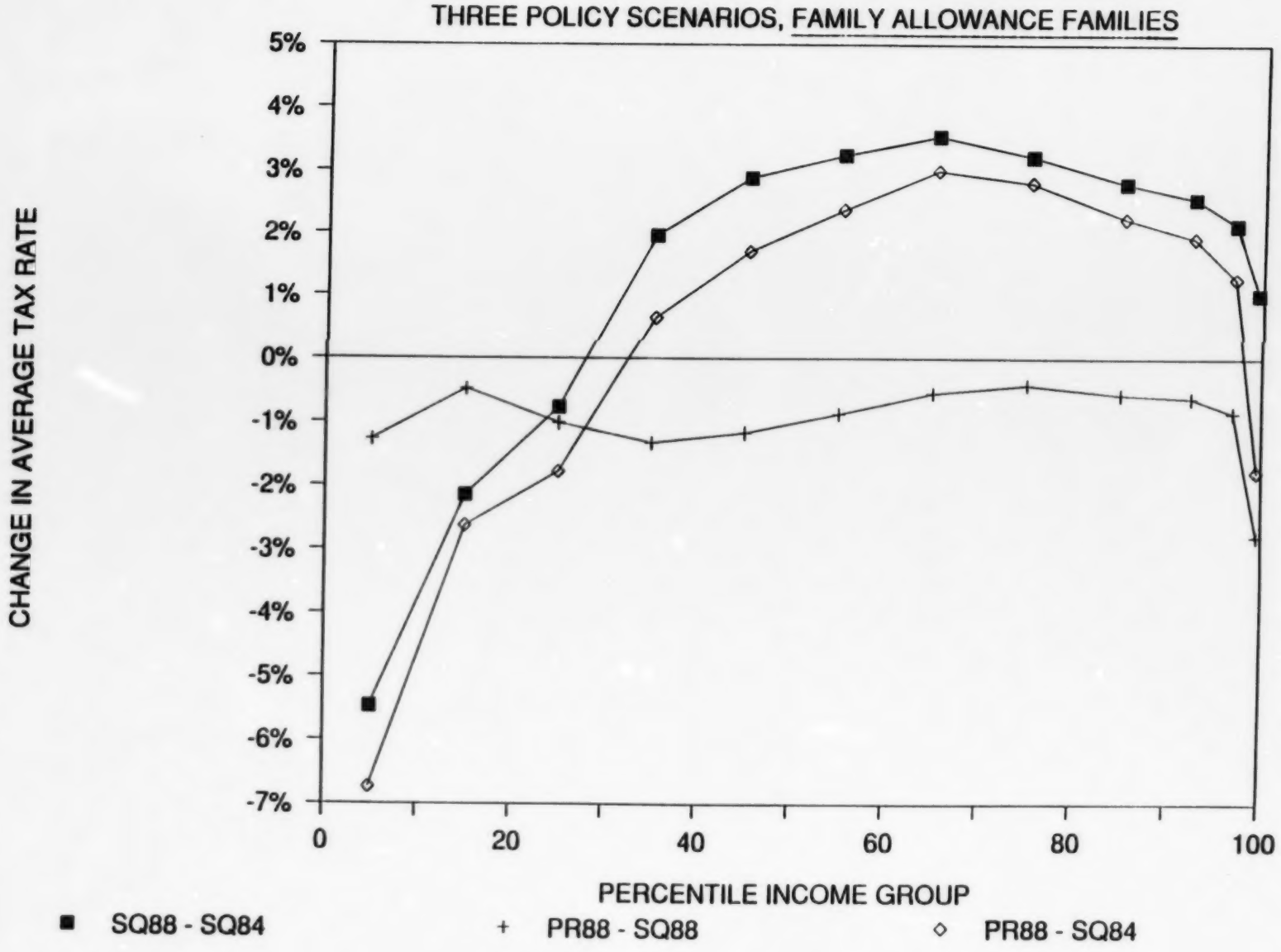


6. AVERAGE INCOME TAX RATES

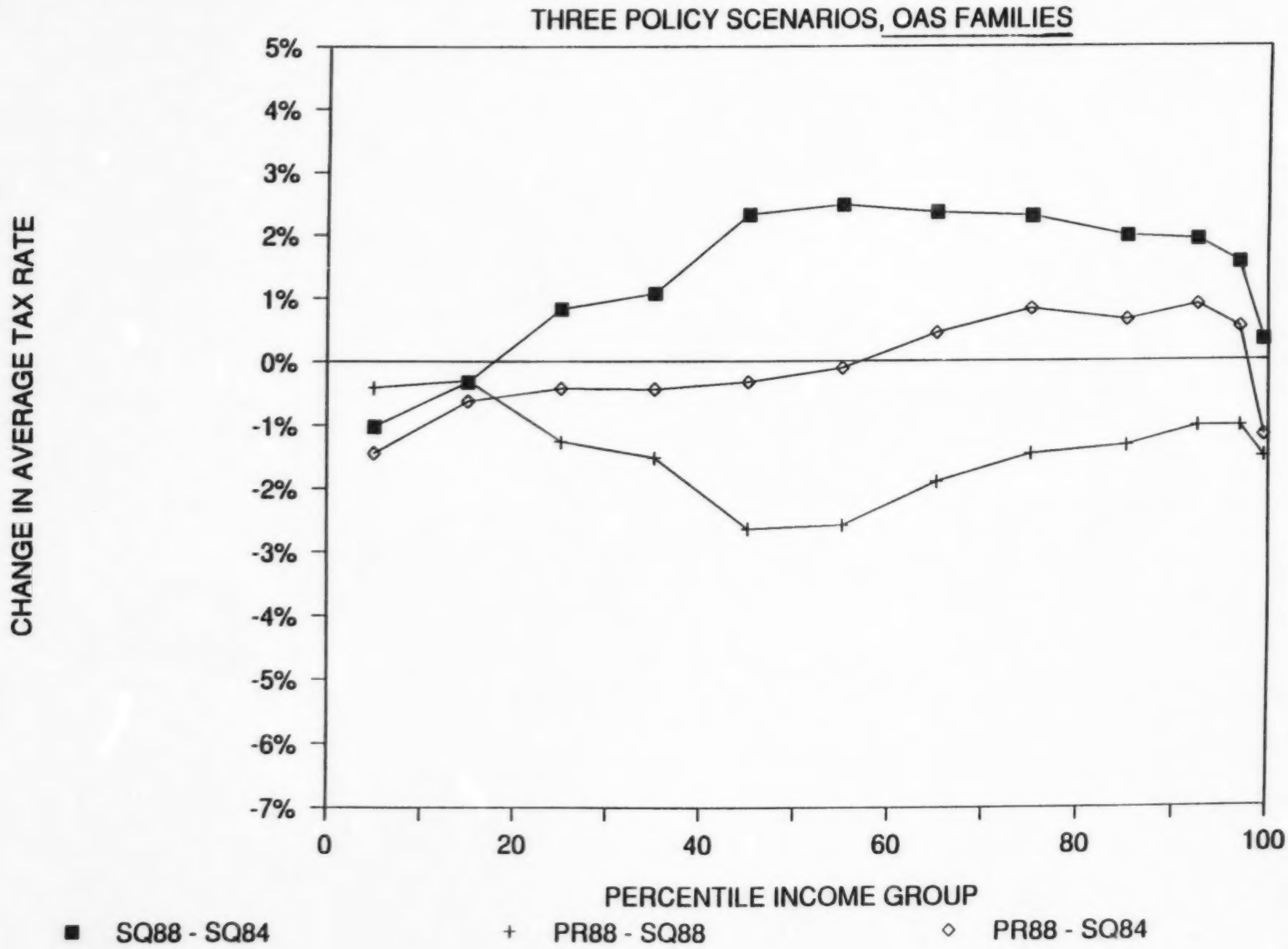
BY FAMILY TYPE, SQ84



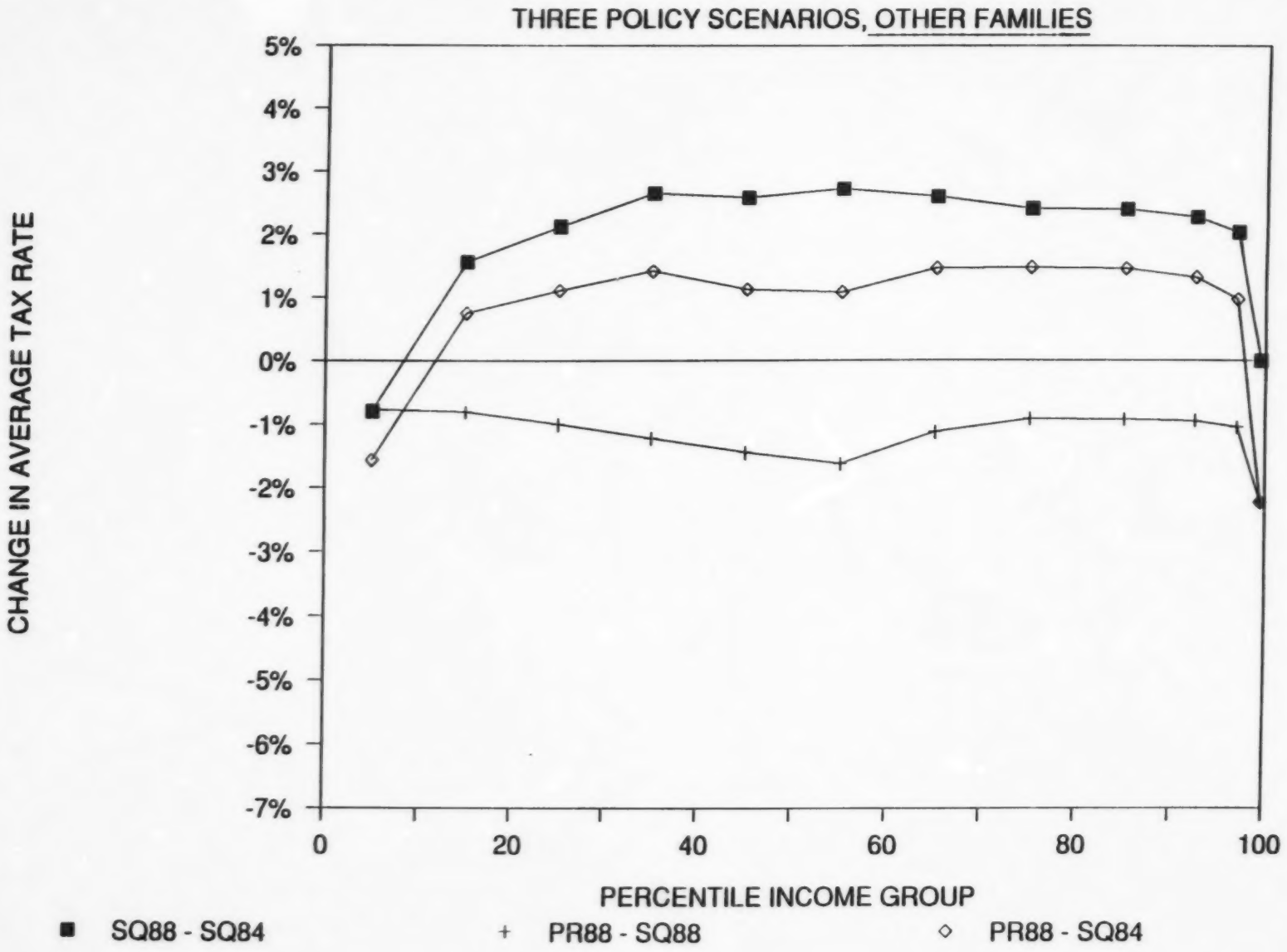
7.1 CHANGE IN AVERAGE TAX RATES



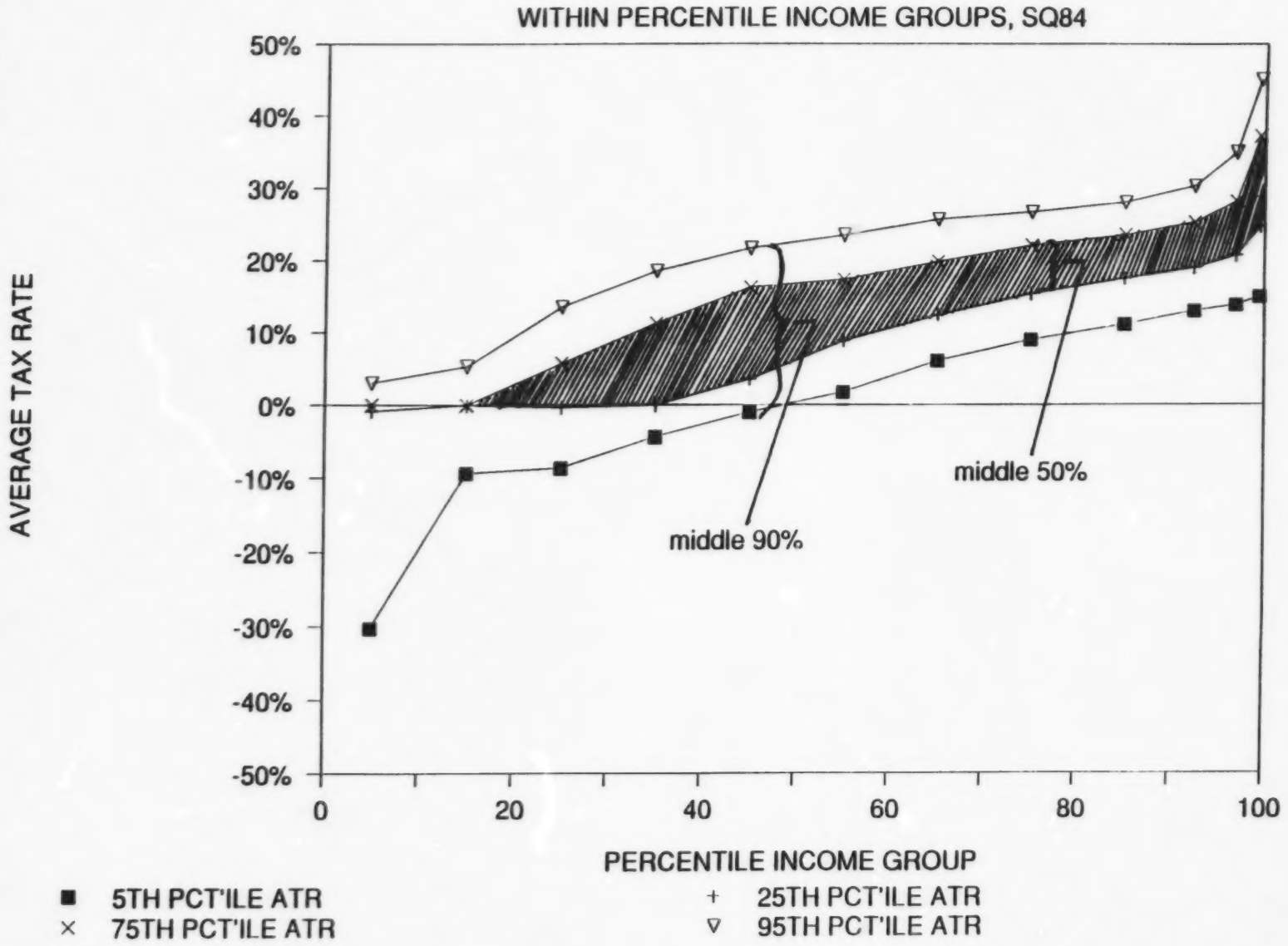
7.2 CHANGE IN AVERAGE TAX RATES



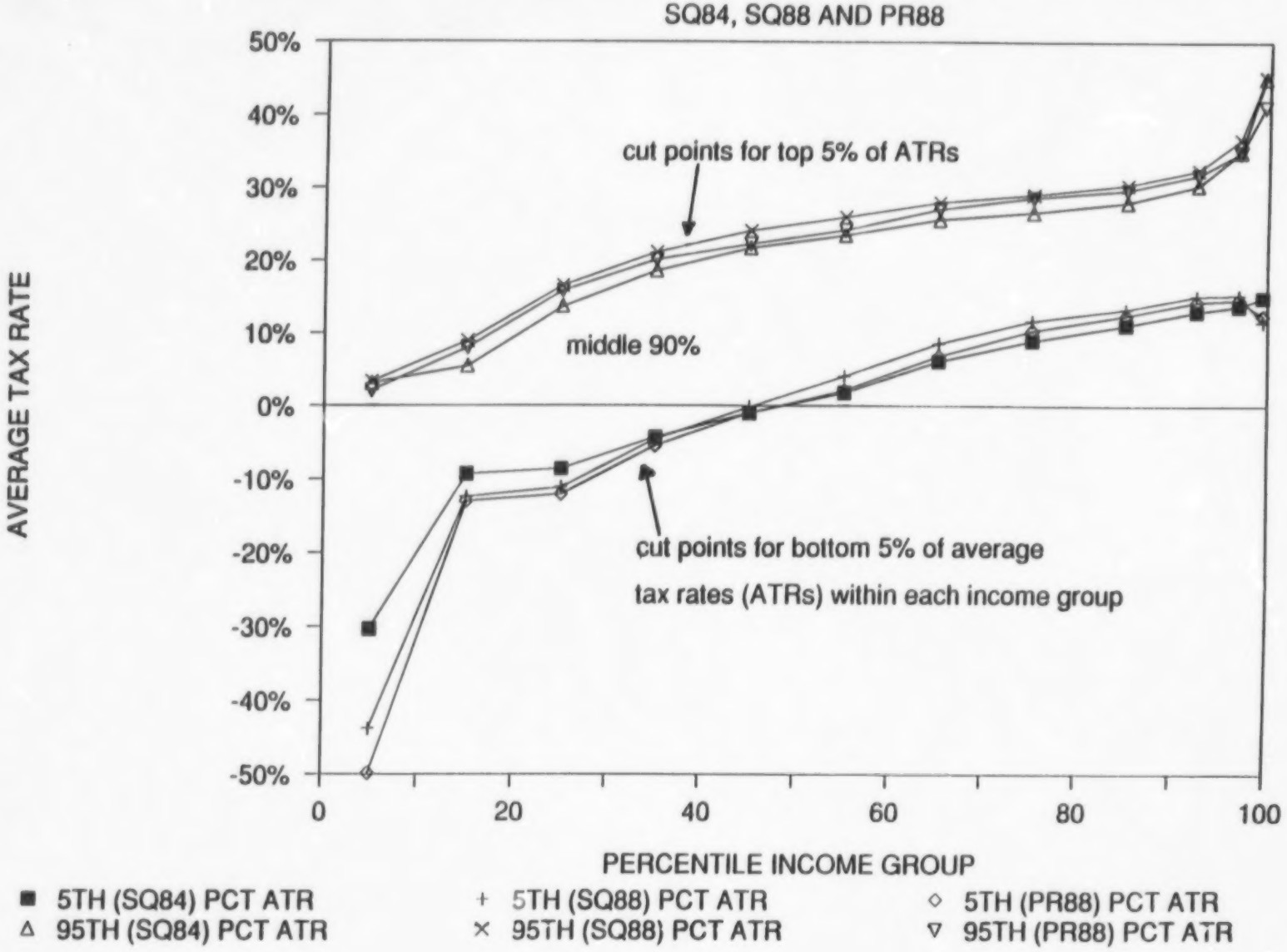
7.3 CHANGE IN AVERAGE TAX RATES



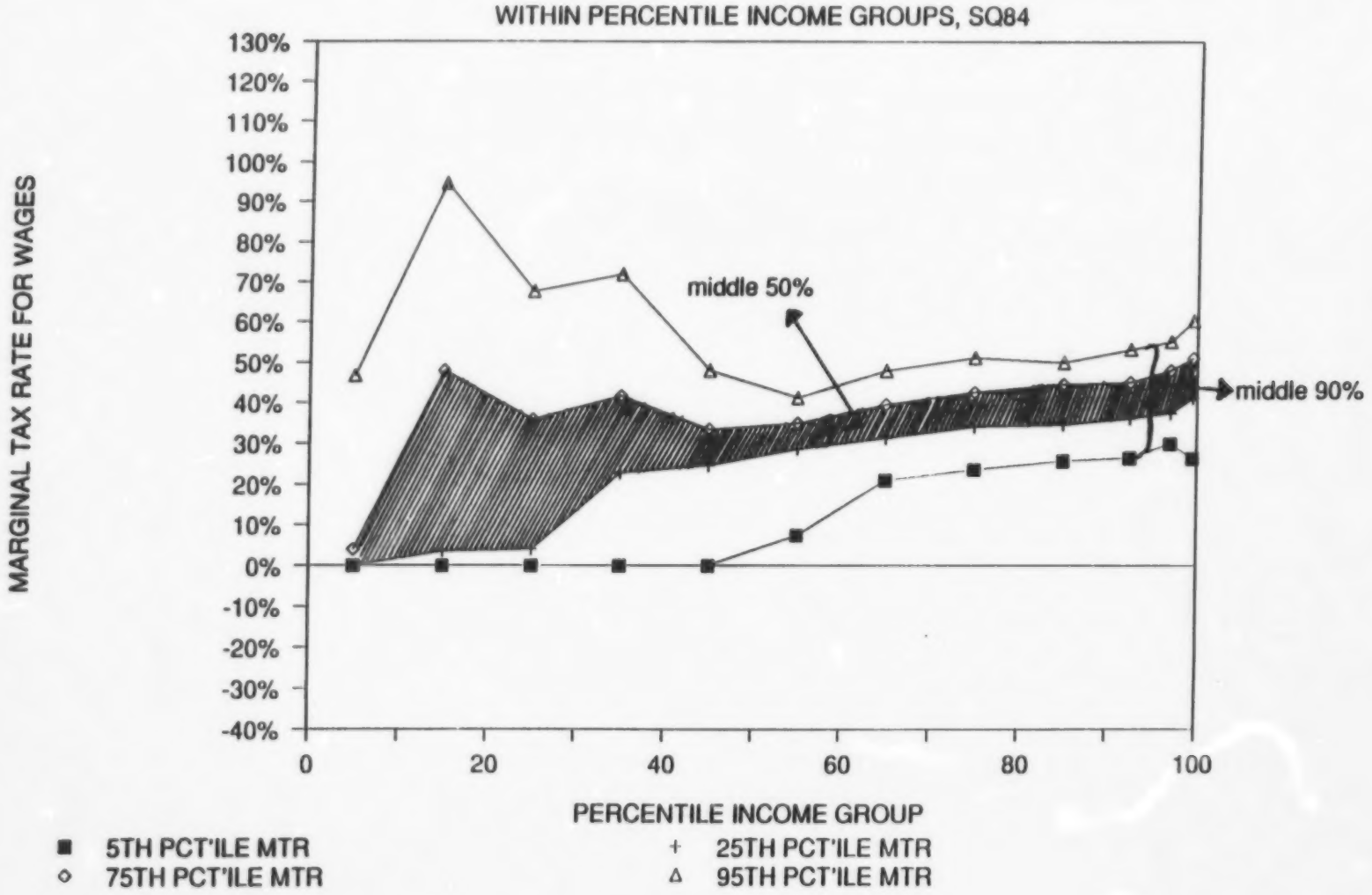
8. VARIATIONS IN AVERAGE INCOME TAX RATES



9. COMPARISON OF THE VARIABILITY IN ATRs

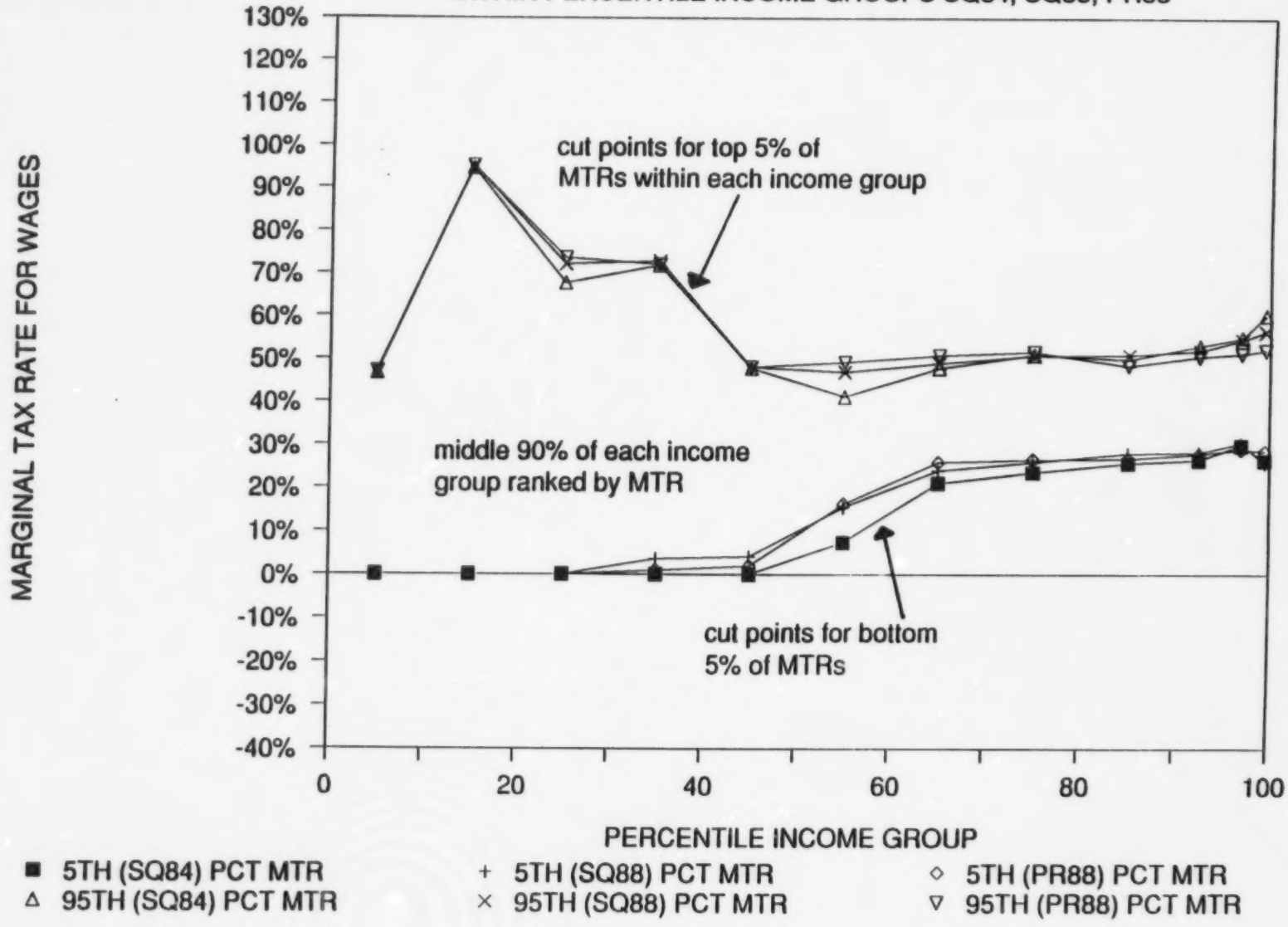


10. VARIATIONS IN MTRS FOR WAGES

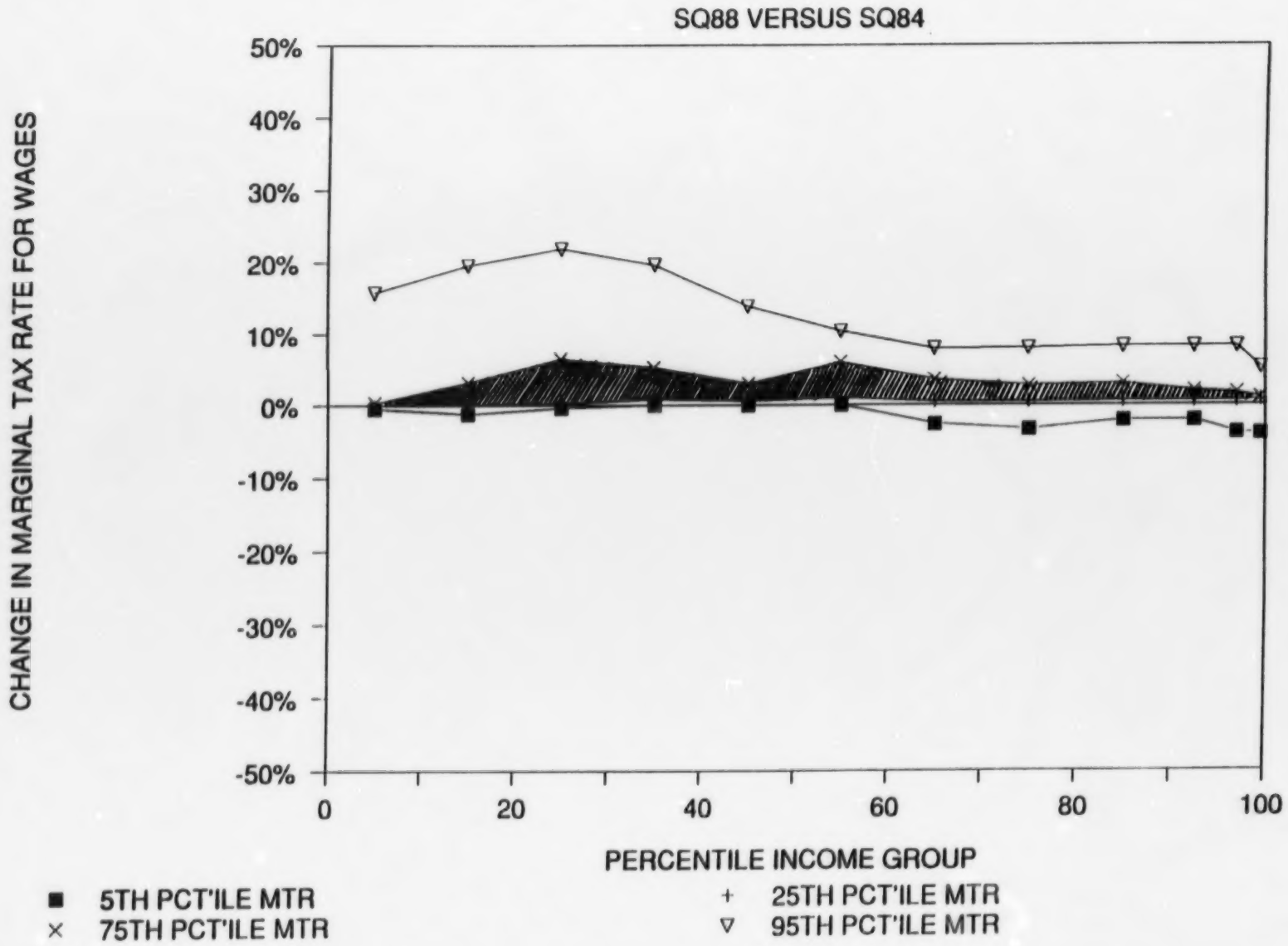


11. VARIABILITY IN MTRs FOR WAGES

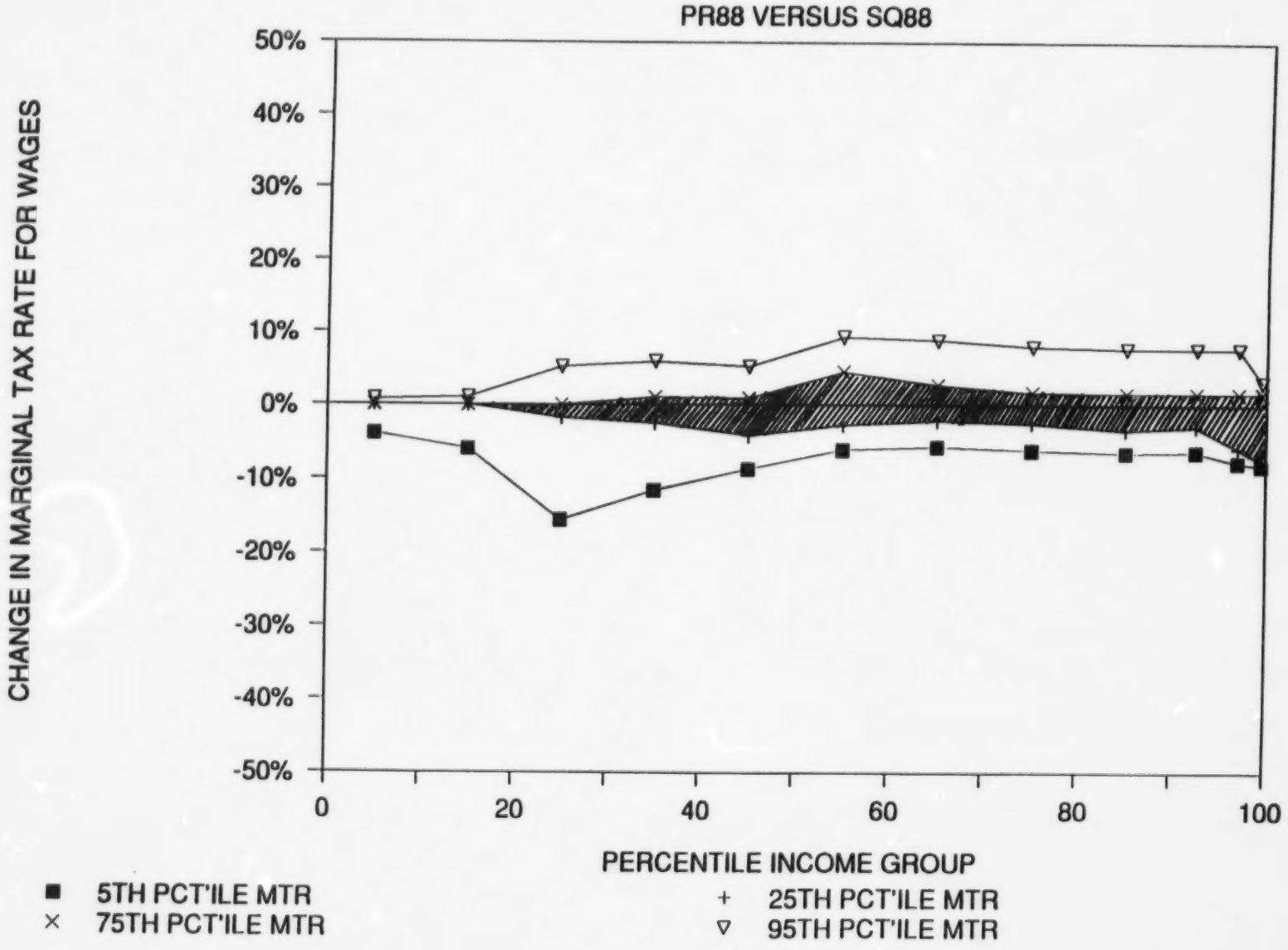
WITHIN PERCENTILE INCOME GROUPS SQ84, SQ88, PR88



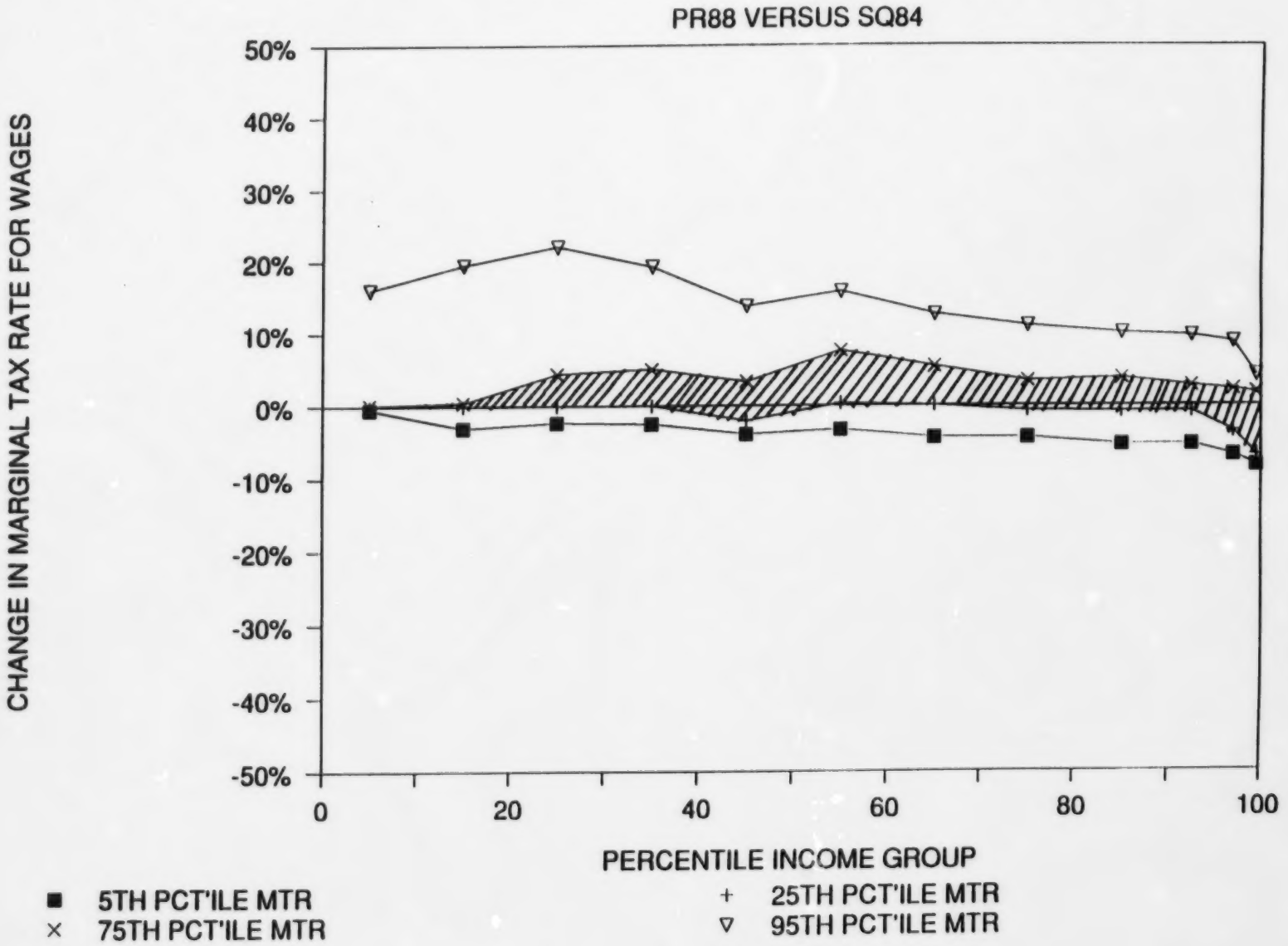
12.1 CHANGE IN MTRs FOR WAGES



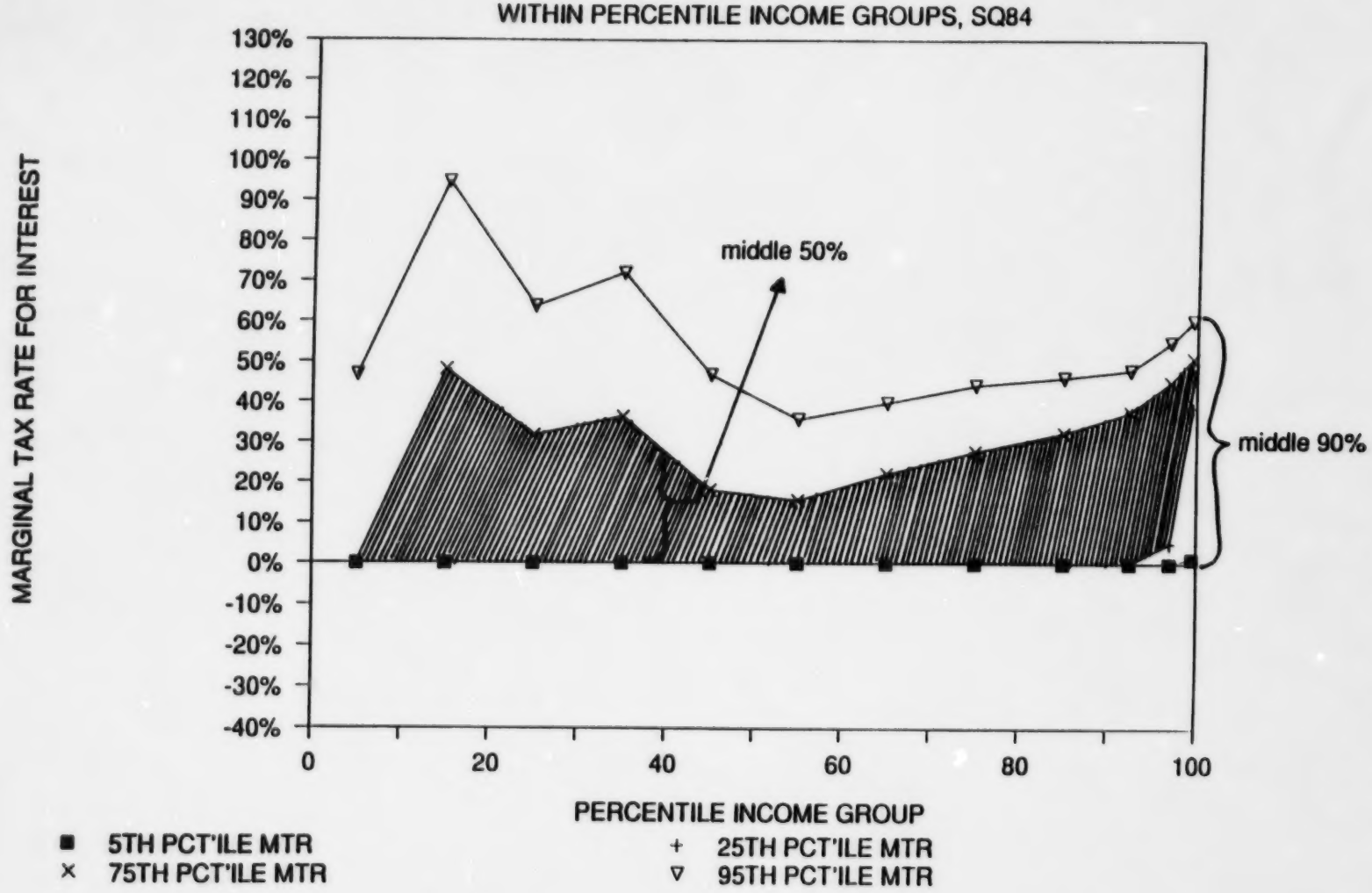
12.2 CHANGE IN MTRs FOR WAGES



12.3 CHANGE IN MTRs FOR WAGES

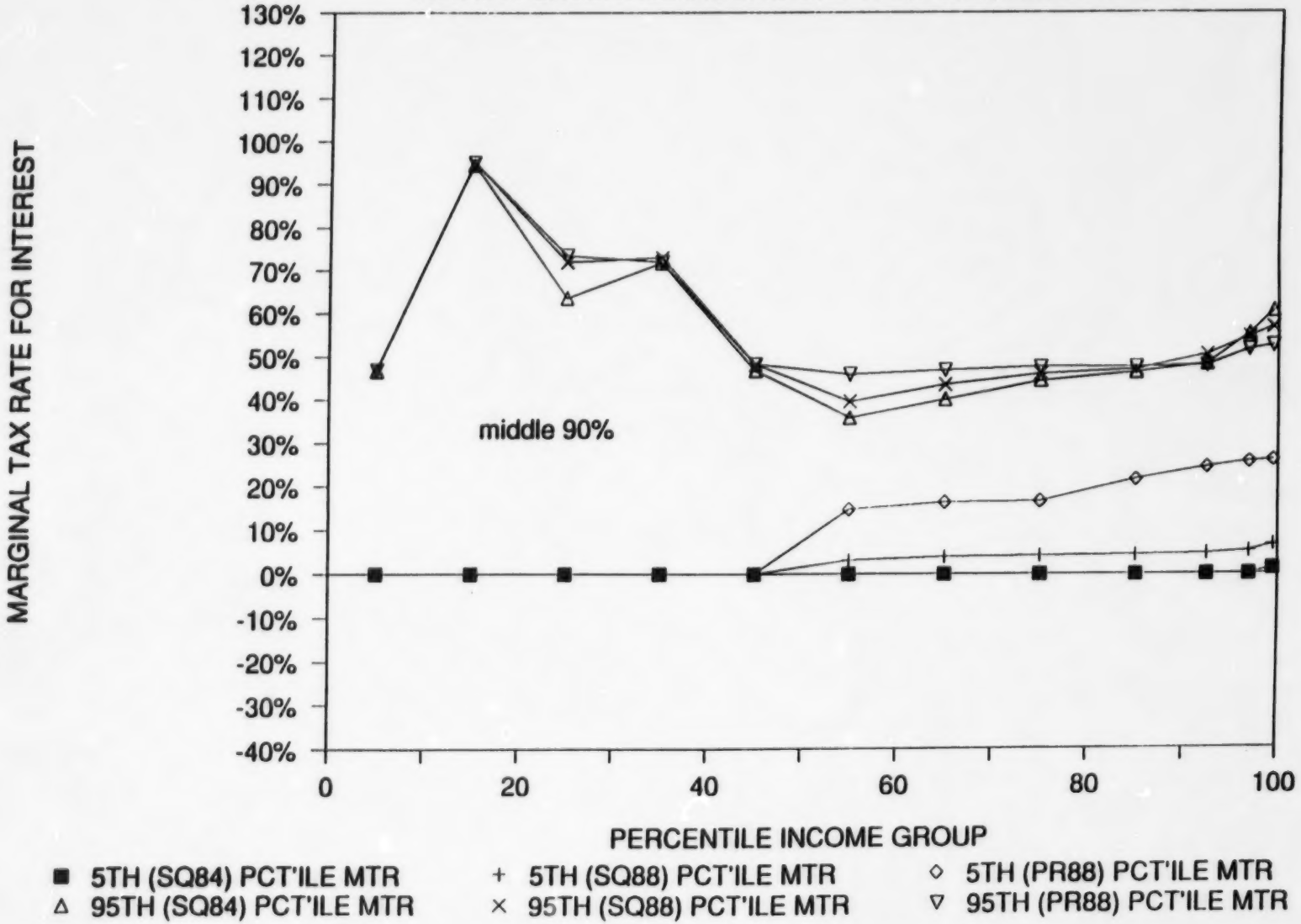


13. VARIATIONS IN MTRS FOR INTEREST

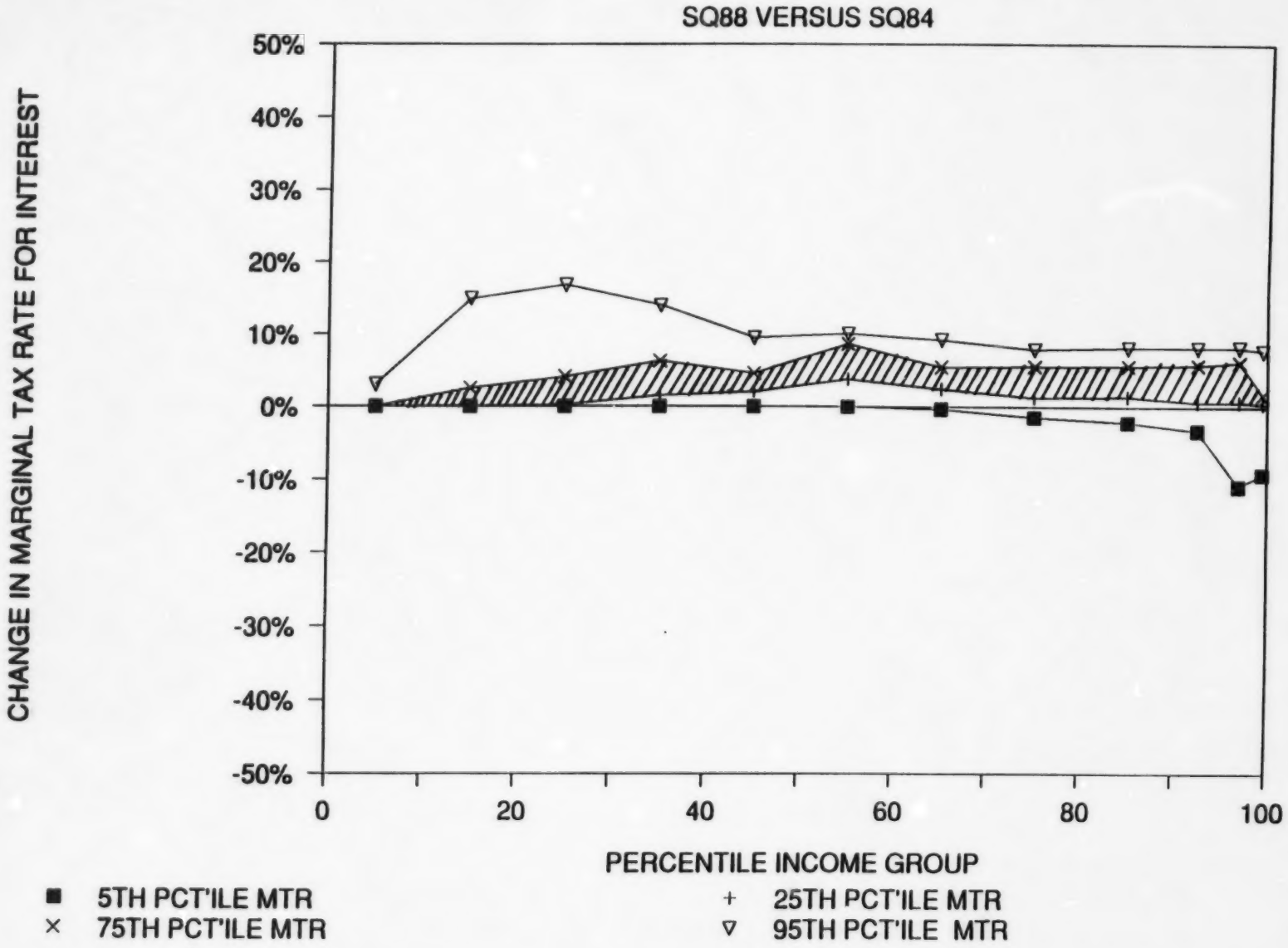


14. VARIABILITY IN MTRs FOR INTEREST

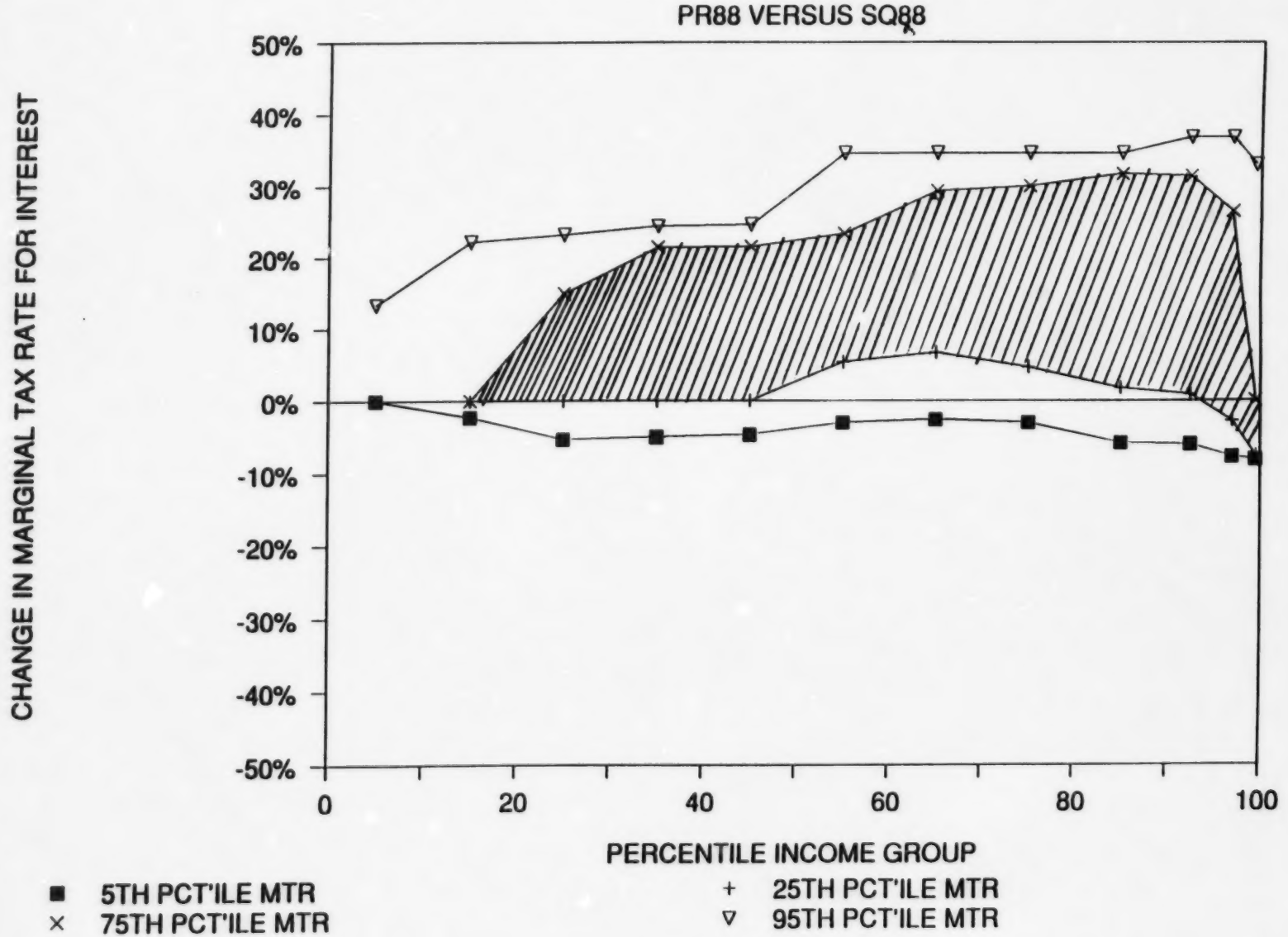
WITHIN PERCENTILE INCOME GROUPS, SQ84, SQ88 AND PR88



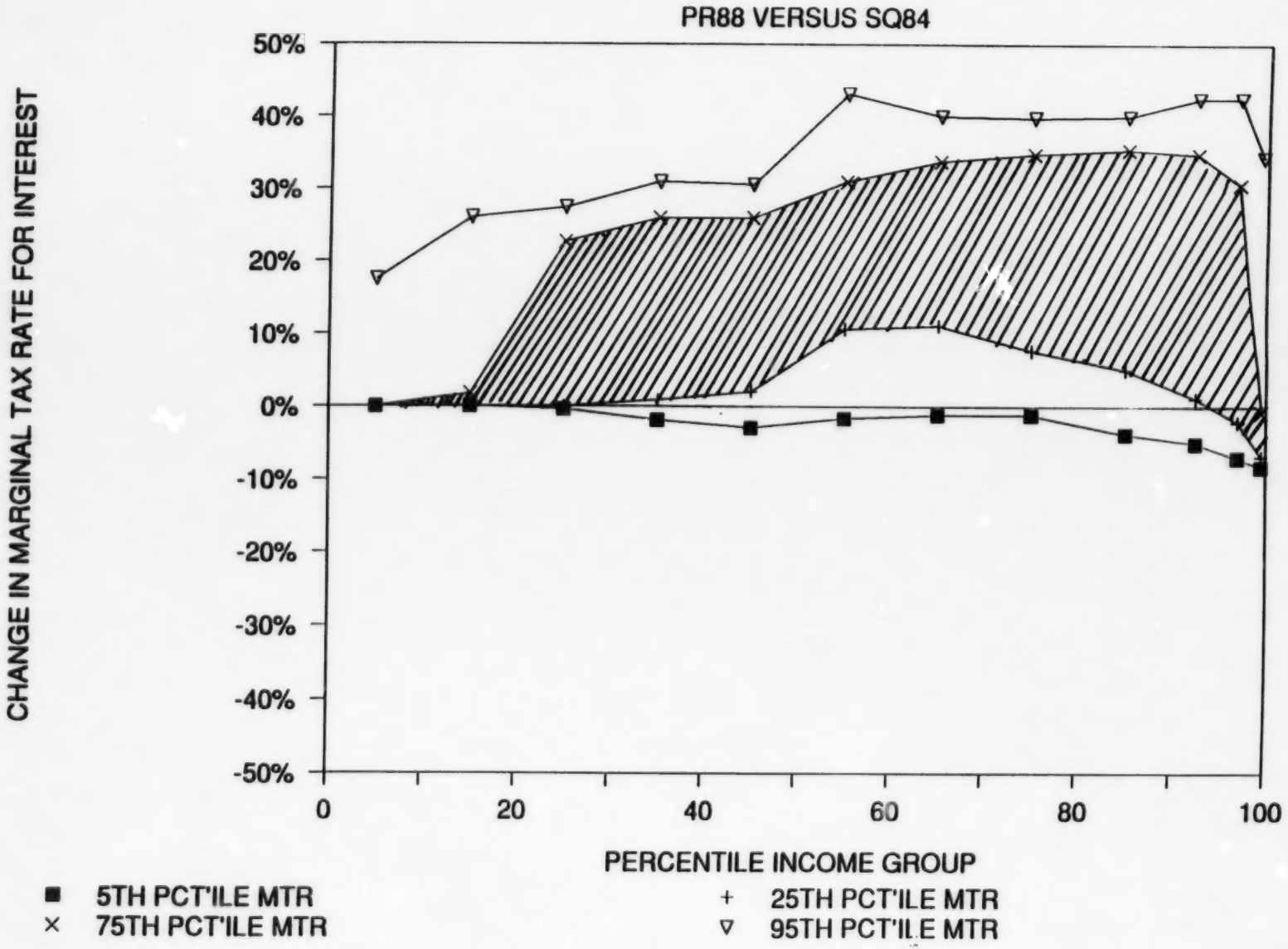
15.1 CHANGE IN MTRs FOR INTEREST



15.2 CHANGE IN MTRs FOR INTEREST

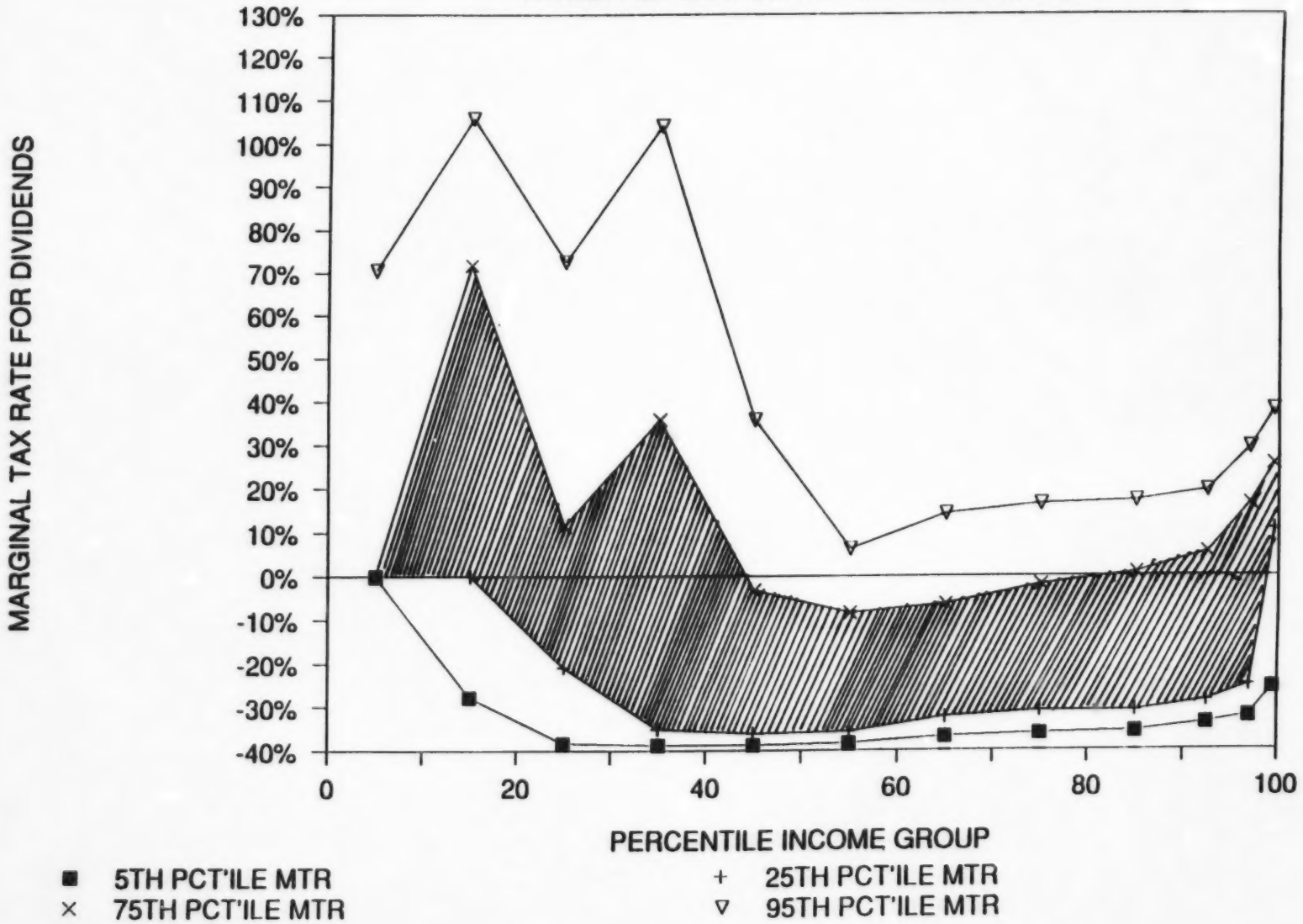


15.3 CHANGE IN MTRs FOR INTEREST



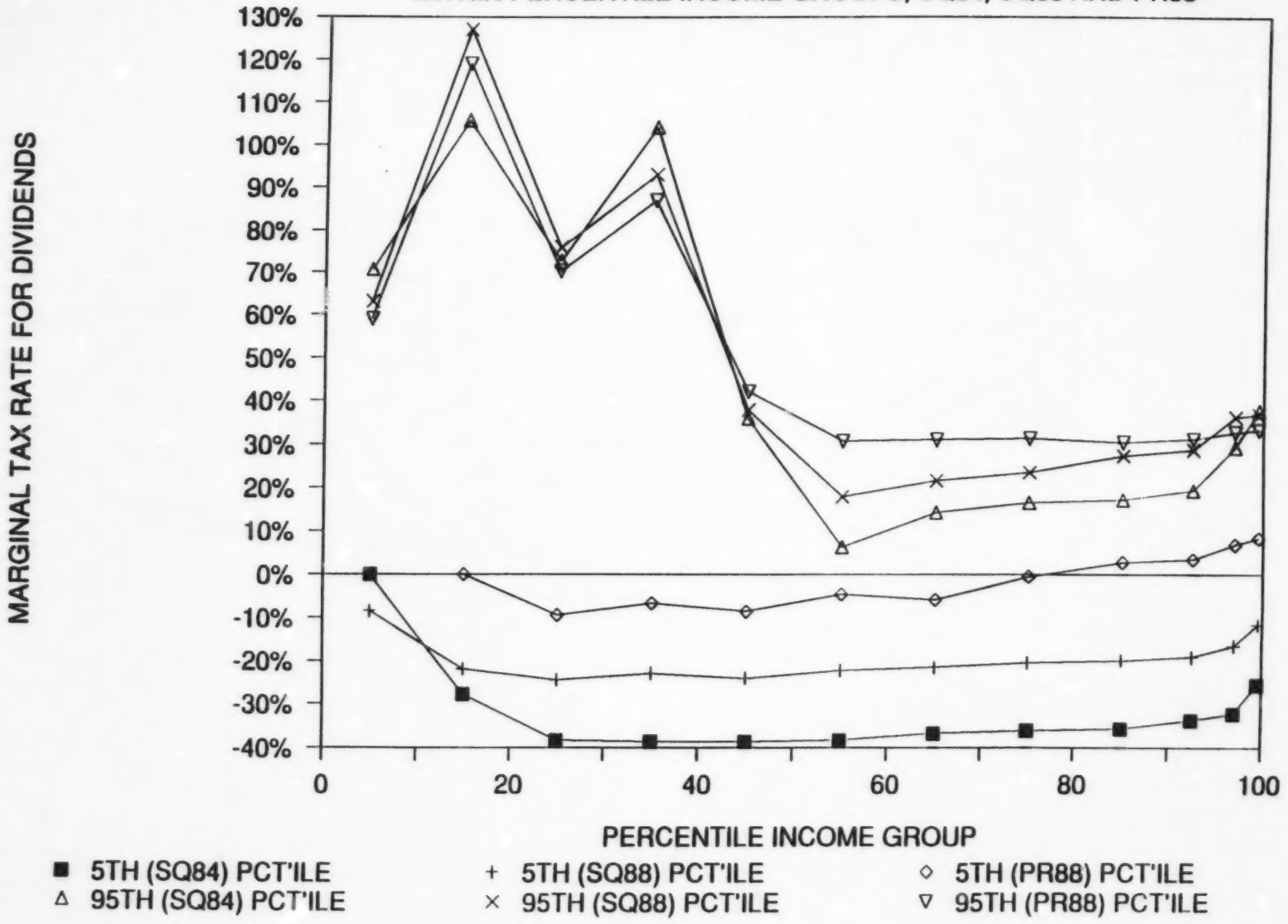
16. VARIATIONS IN MTRs FOR DIVIDENDS

WITHIN PERCENTILE INCOME GROUPS, SQ84

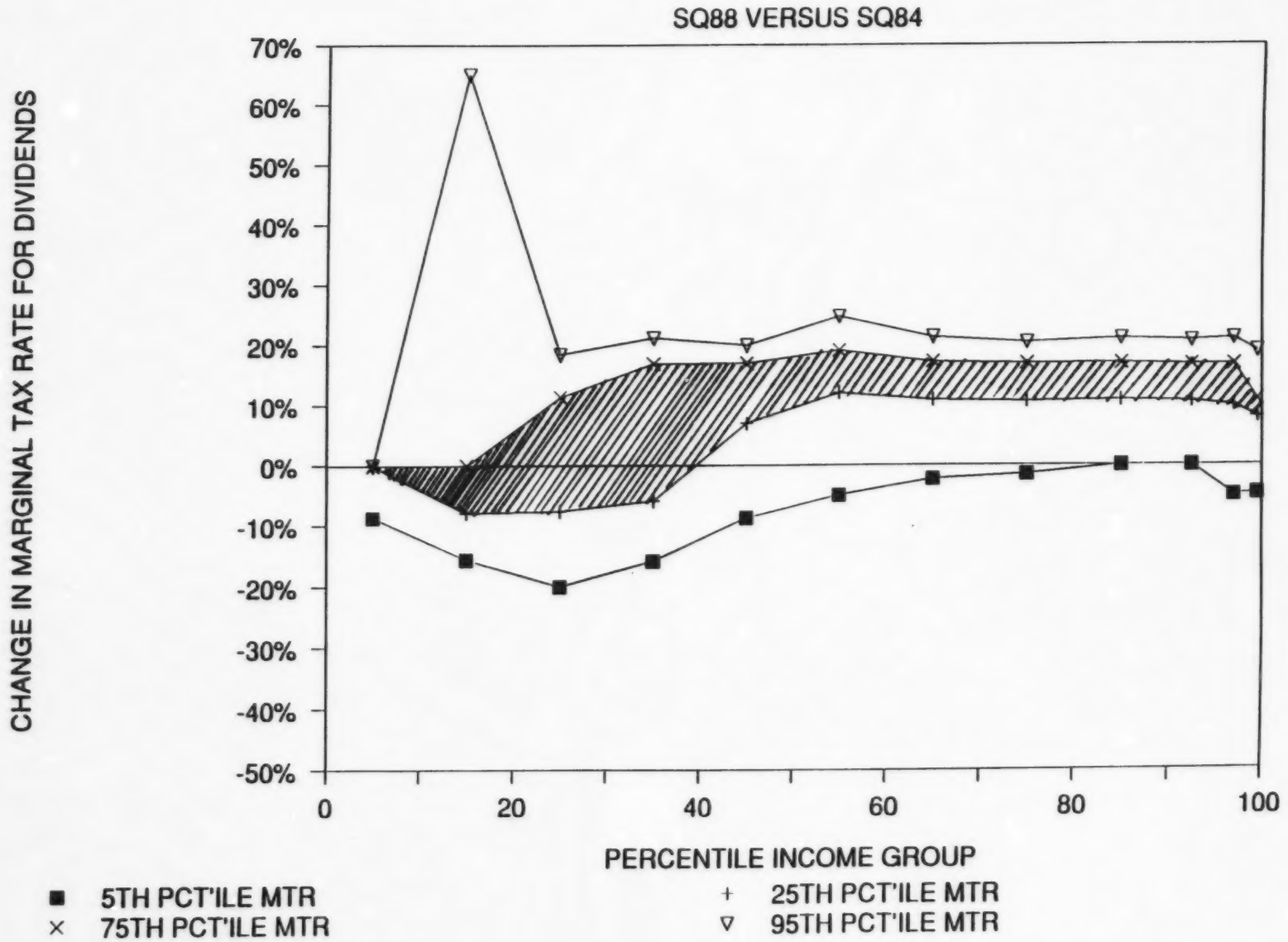


17. VARIABILITY IN MTRs FOR DIVIDENDS

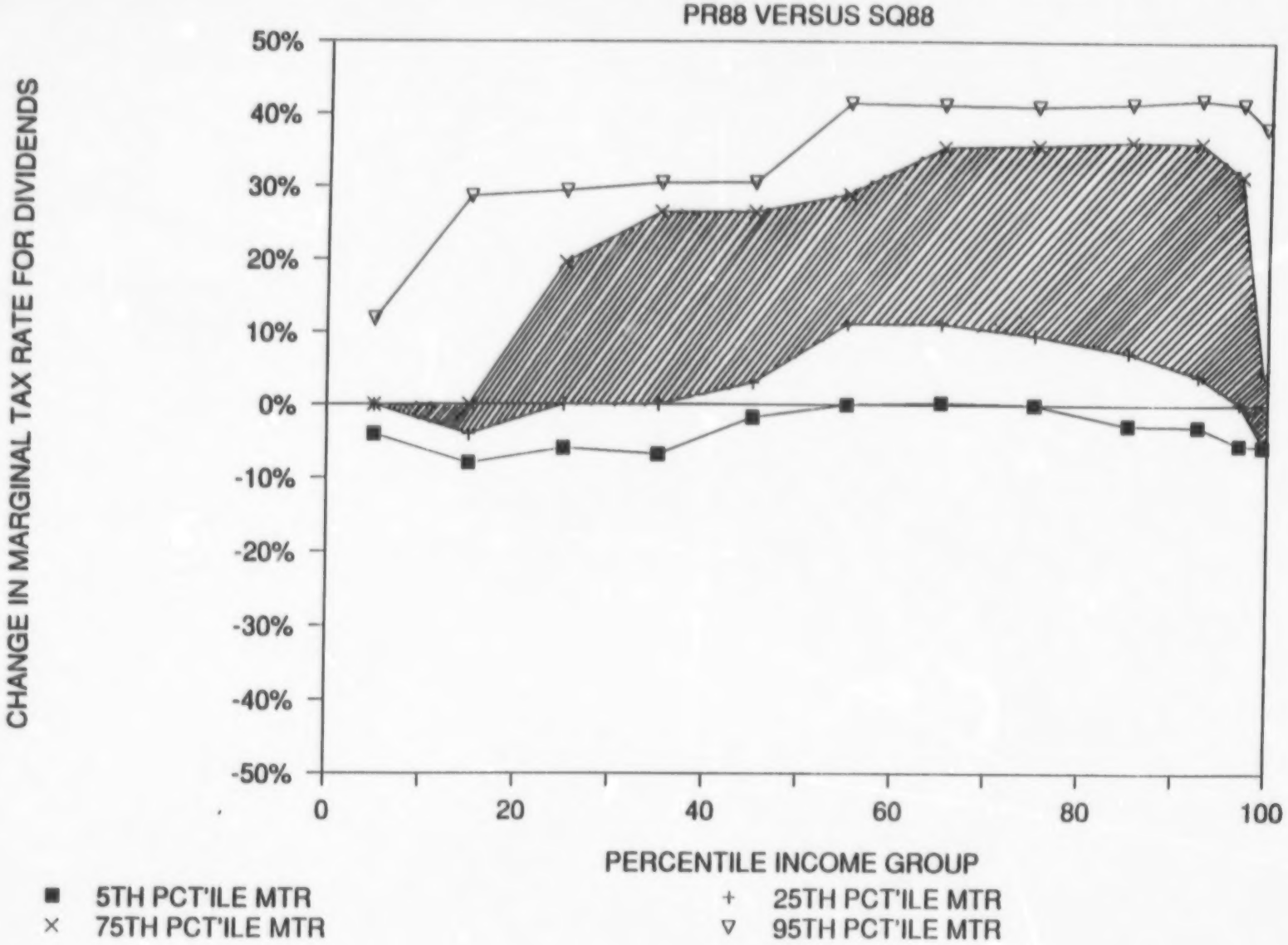
WITHIN PERCENTILE INCOME GROUPS, SQ84, SQ88 AND PR88



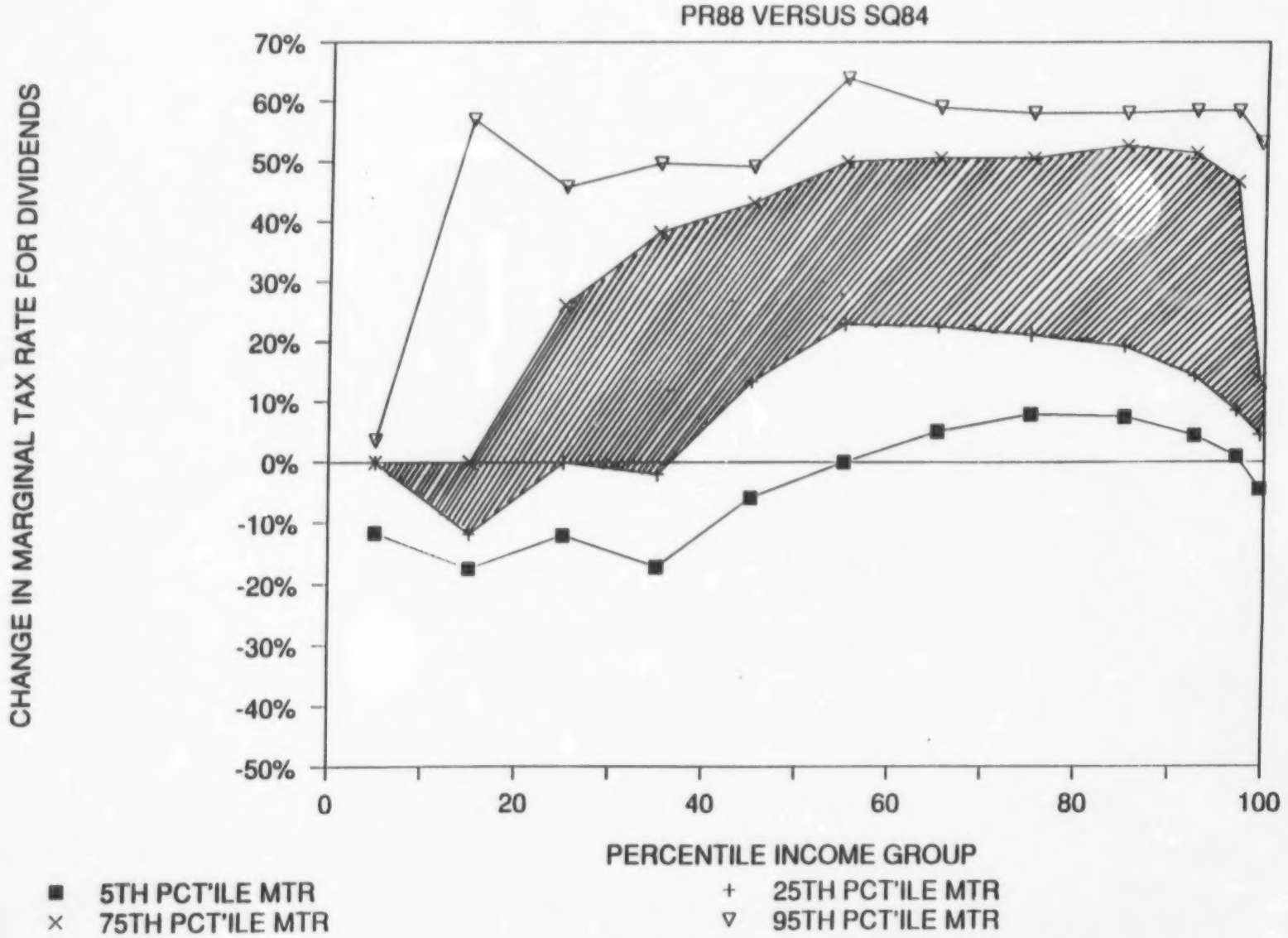
18.1 CHANGE IN MTRs FOR DIVIDENDS



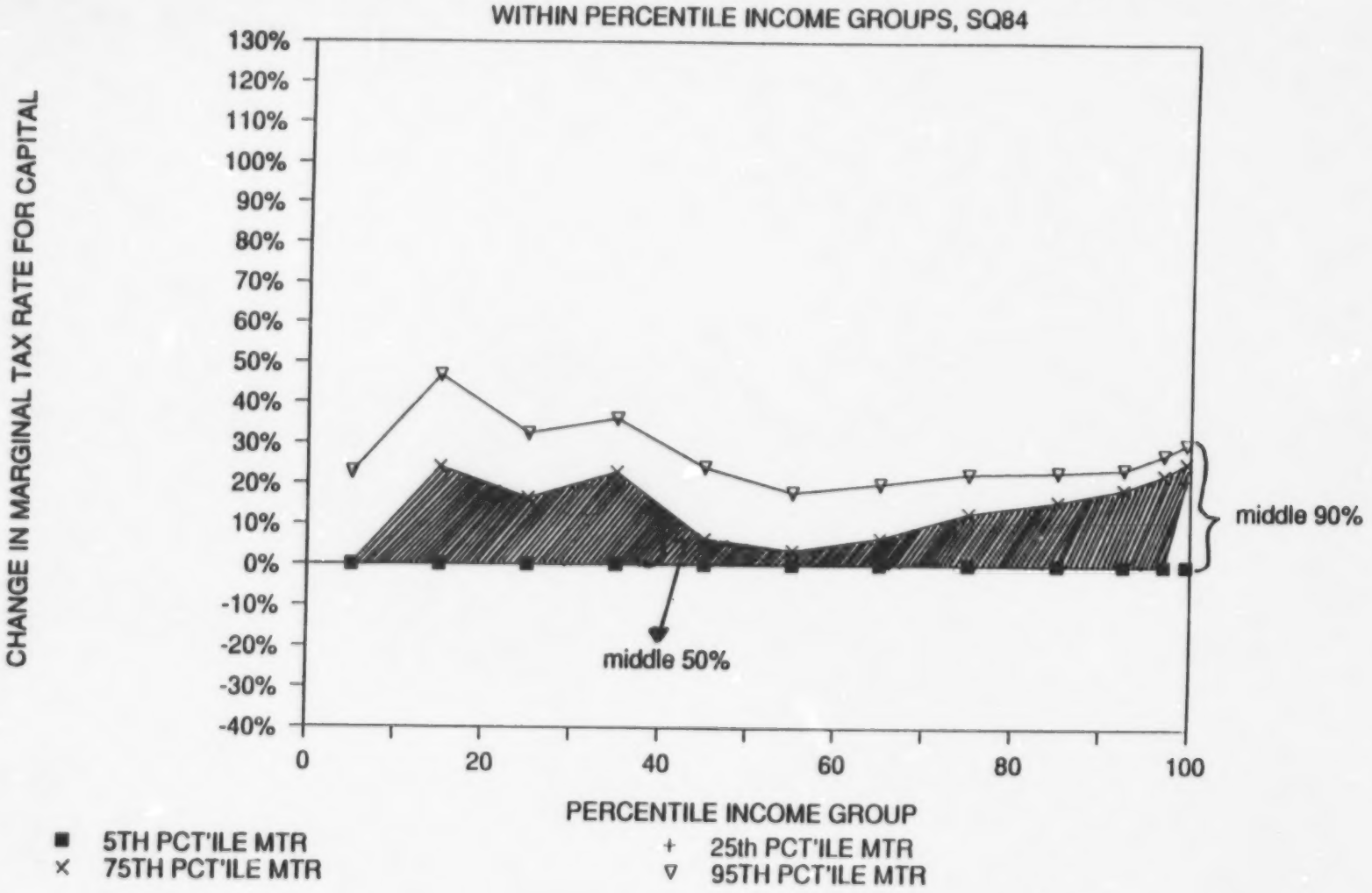
18.2 CHANGE IN MTRs FOR DIVIDENDS



18.3 CHANGE IN MTRs FOR DIVIDENDS

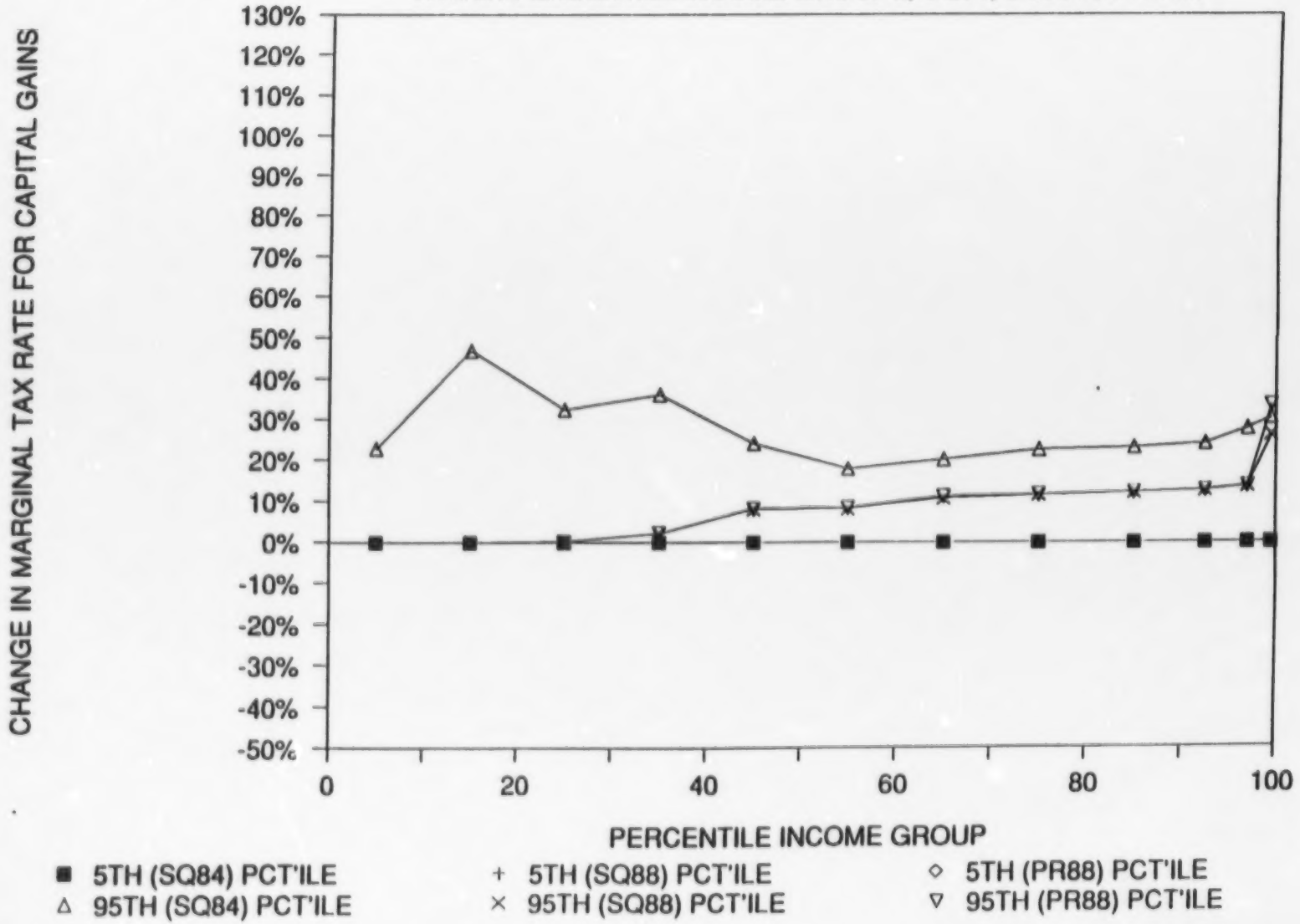


19. VARIATIONS IN MTRs FOR CAPITAL GAINS

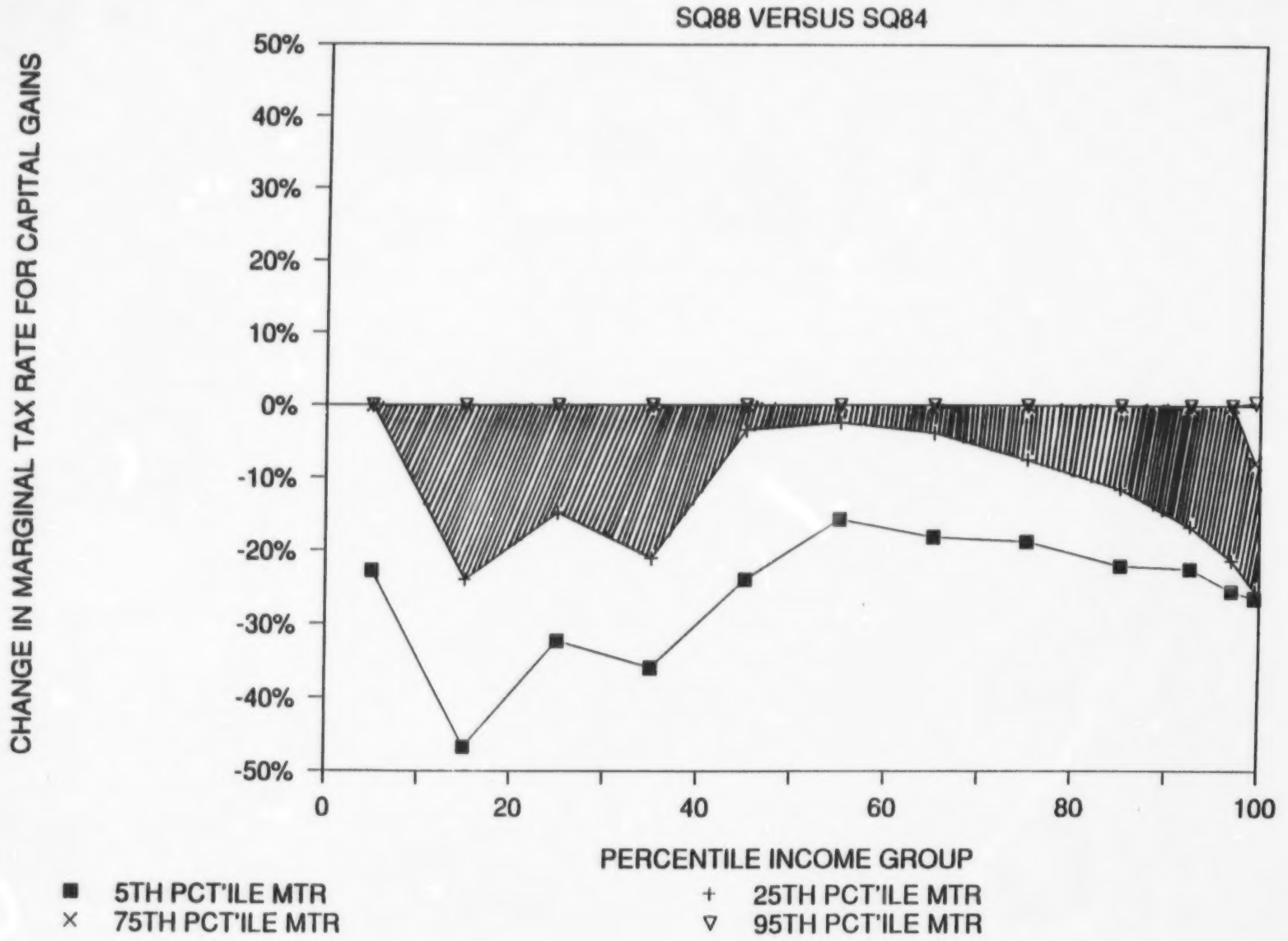


20. VARIABILITY IN MTRs FOR CAPITAL GAINS

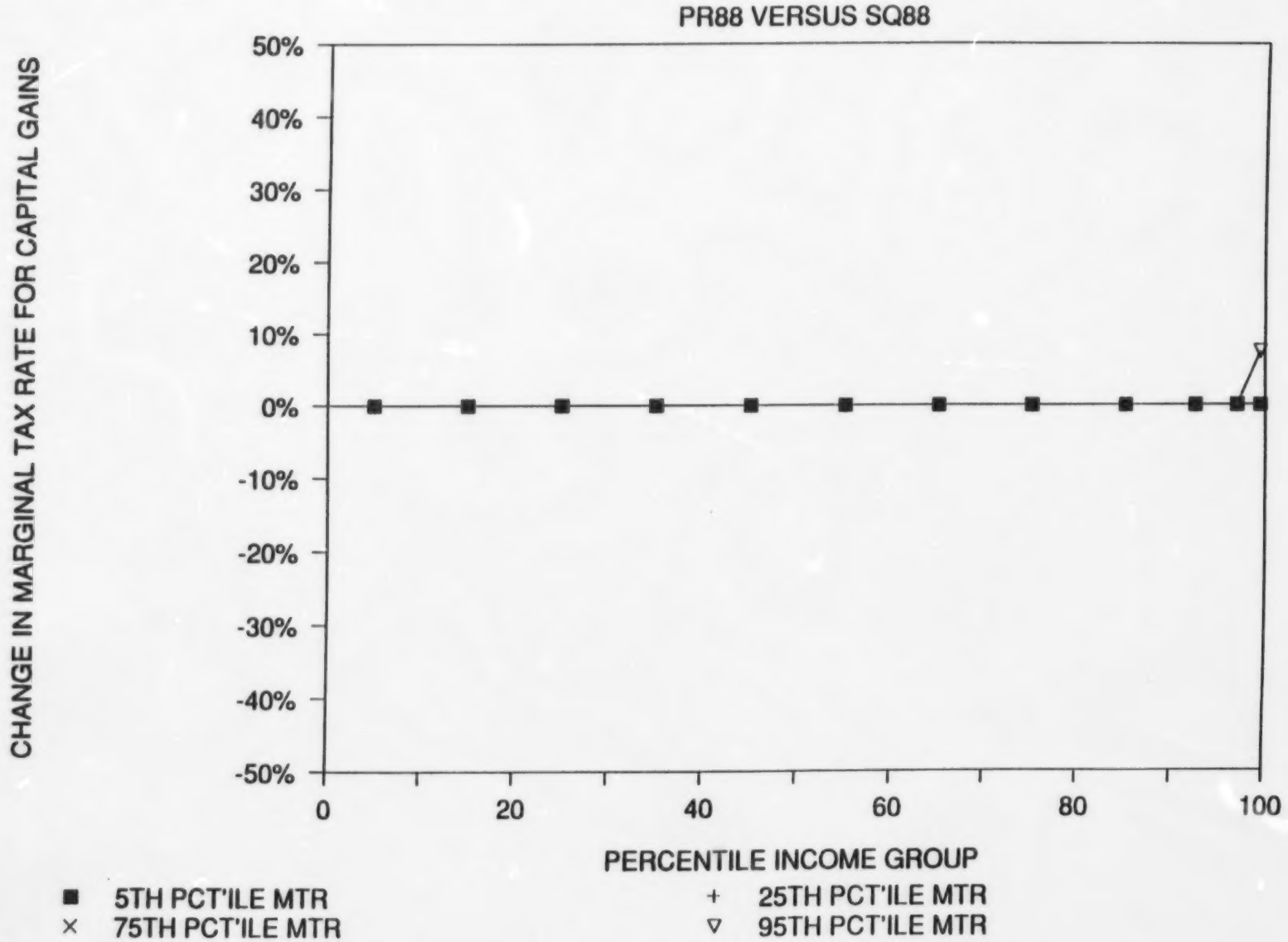
WITHIN PERCENTILE INCOME GROUPS, SQ84, SQ88 AND PR88



21.1 CHANGES IN MTRs FOR CAPITAL GAINS

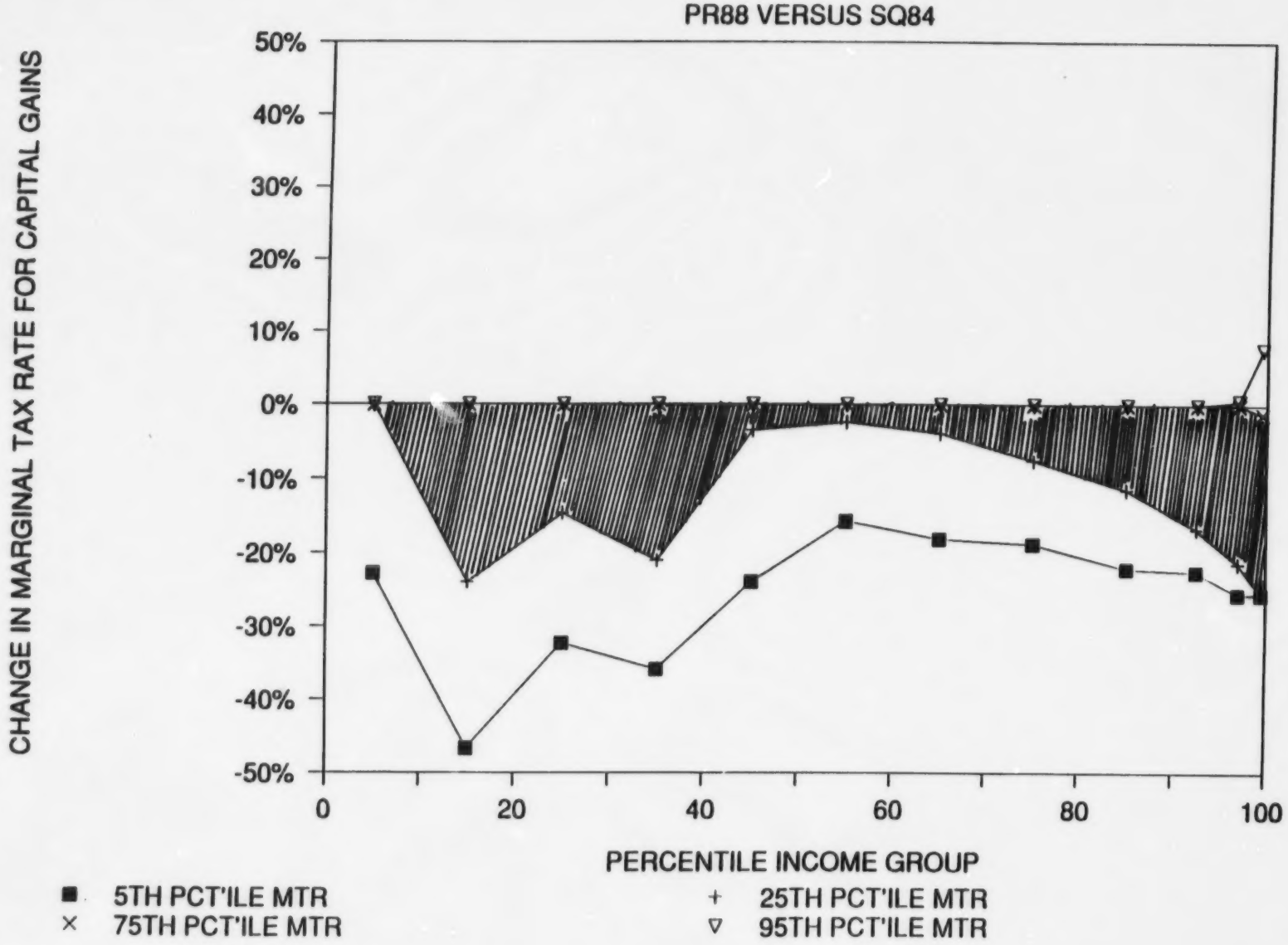


21.2 CHANGE IN THE MTRs FOR CAPITAL GAINS

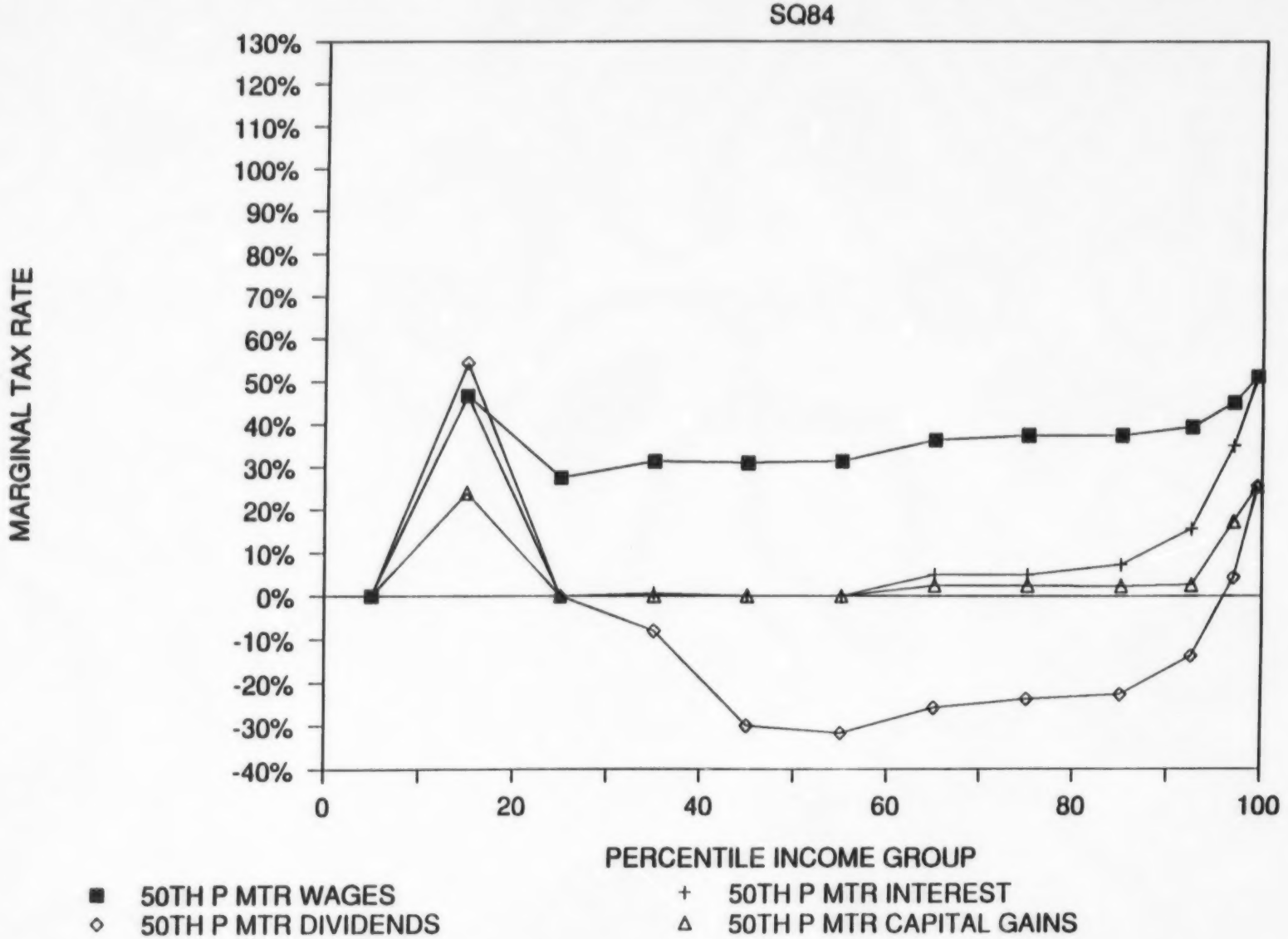


NOTE: ALL FOUR LINES ARE SUPERIMPOSED, EXCEPT AT THE TOP OF THE INCOME SPECTRUM.

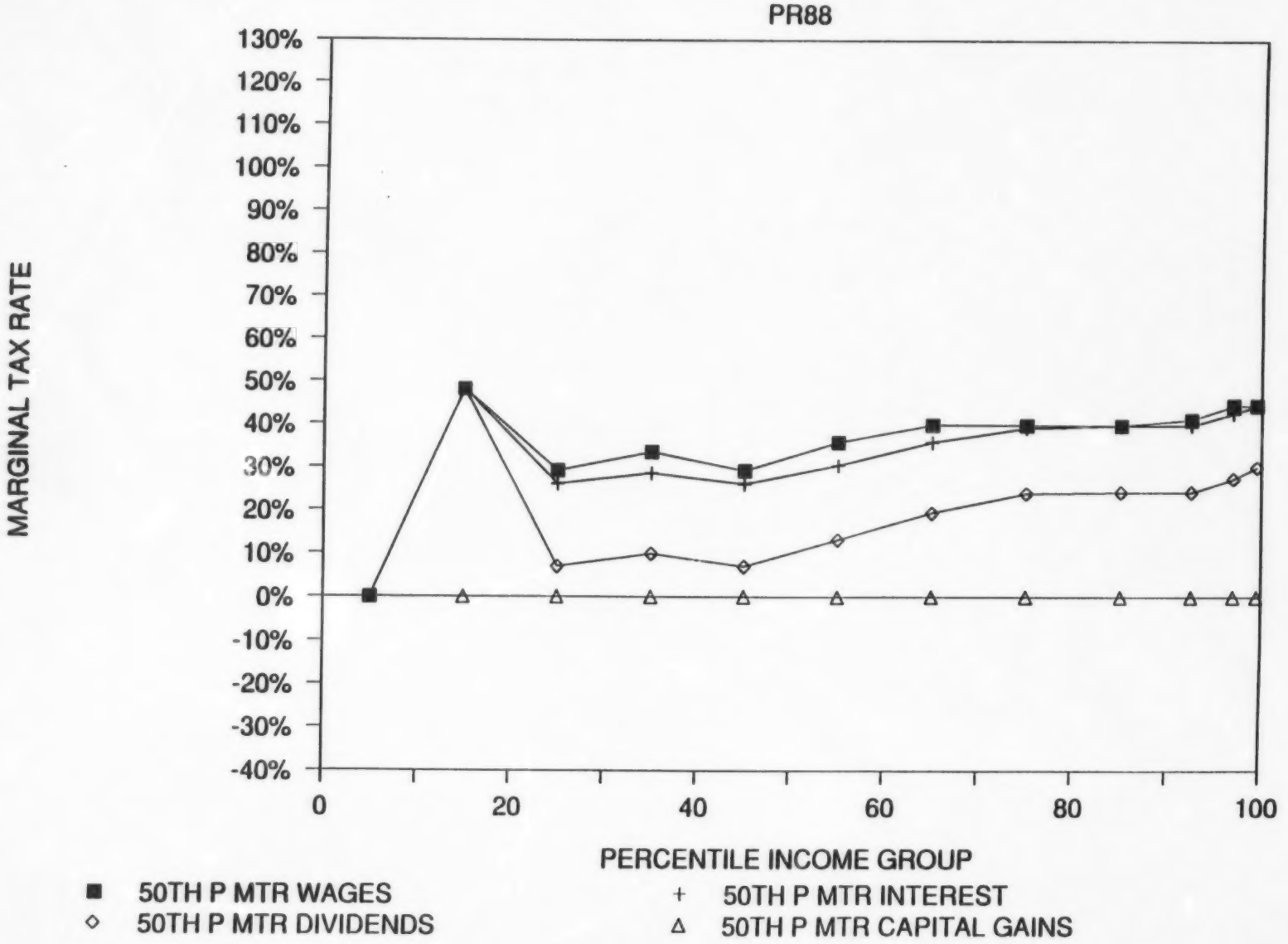
21.3 CHANGE IN MTRs FOR CAPITAL GAINS



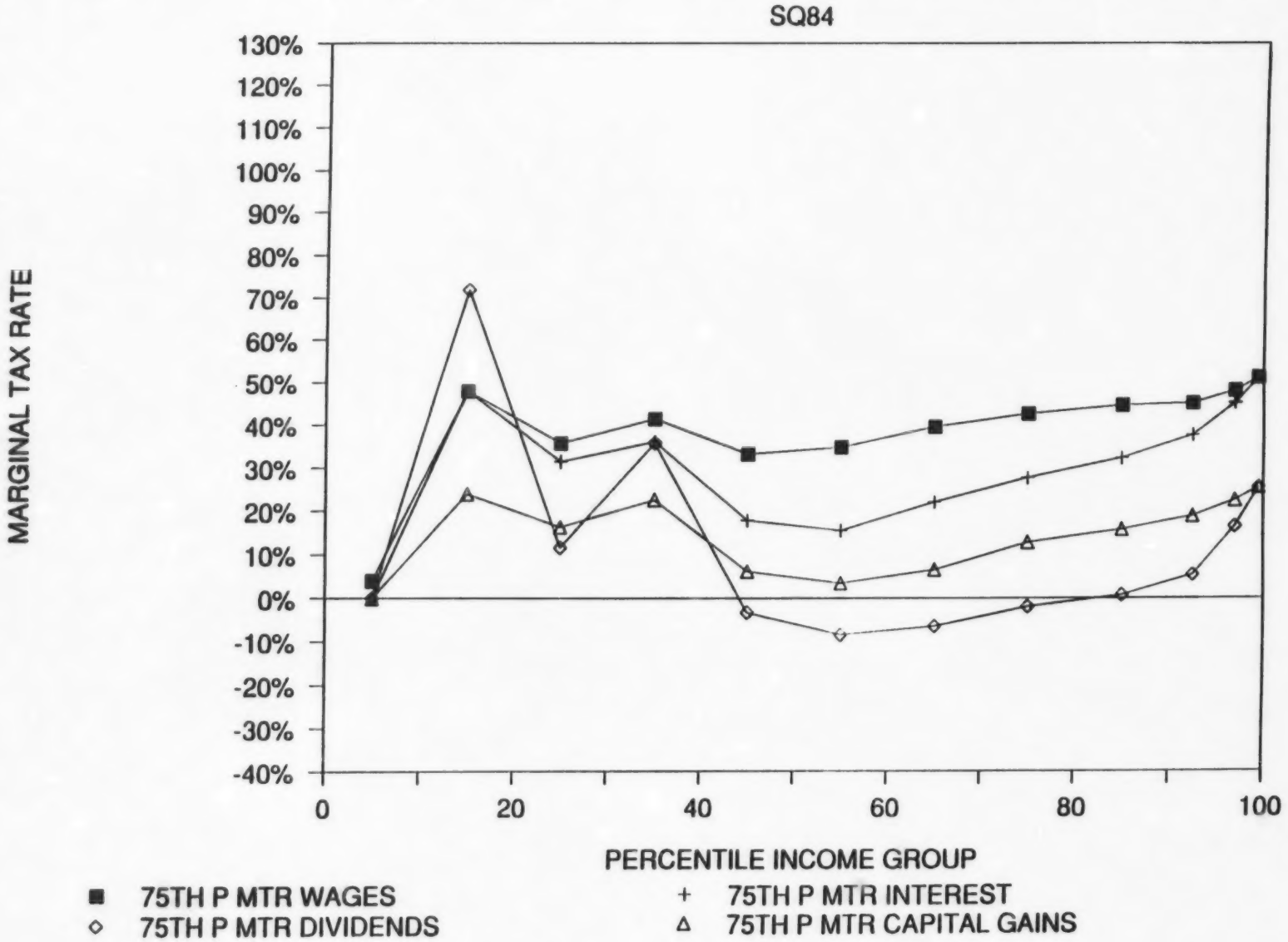
22.1 VARIATIONS IN MARGINAL TAX RATES



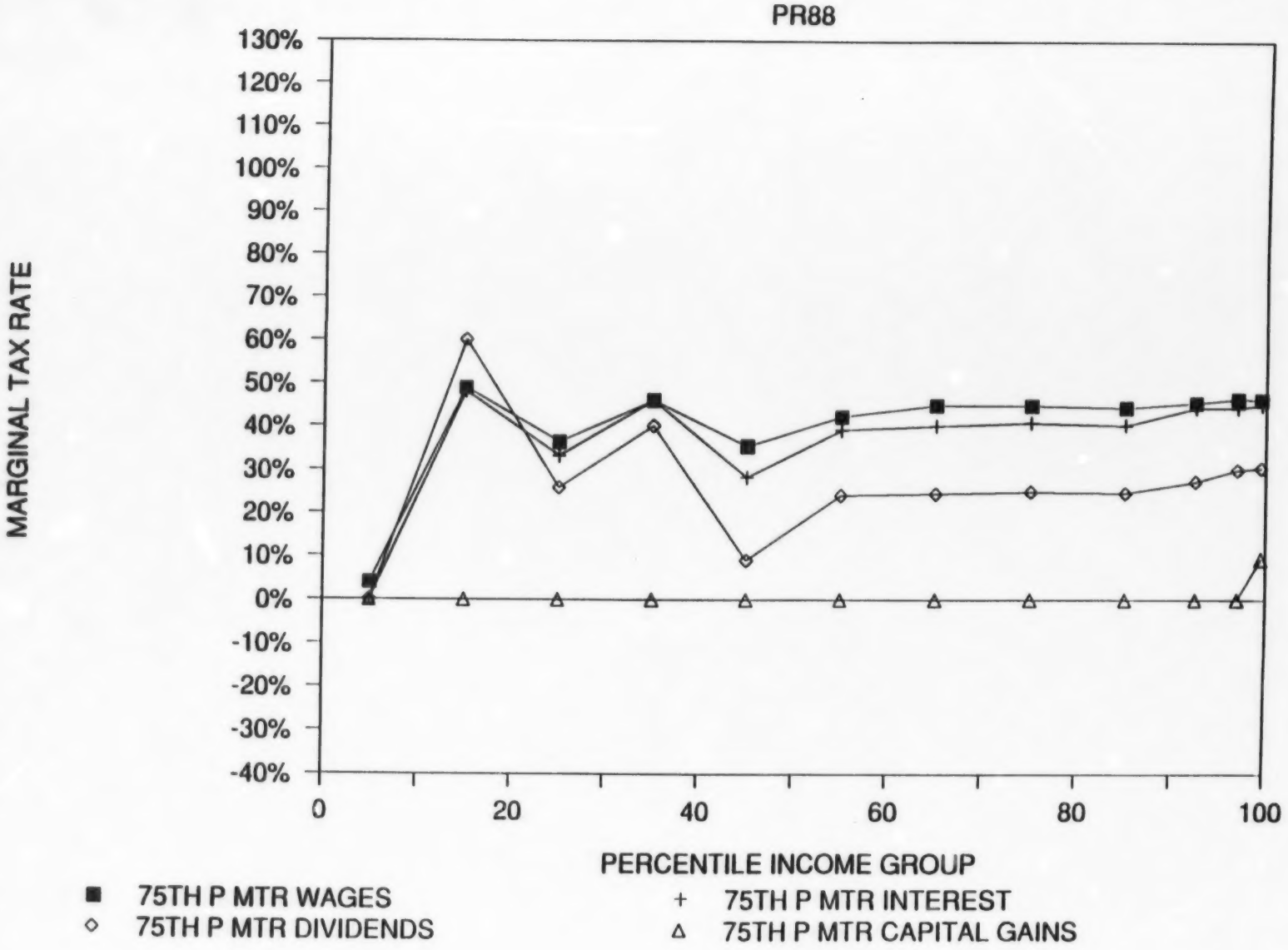
22.2 VARIATIONS IN MARGINAL TAX RATES



22.3 VARIATIONS IN MARGINAL TAX RATES



22.4 VARIATIONS IN MARGINAL TAX RATES



Appendix

The Social Policy Simulation Database (SPSD) is a complex synthetic merge of several original databases. In order to give the reader some indication of the sampling errors that may be present, the following table shows the raw sample counts for the main groupings that have been used in the analysis. These sample counts are in two parts. The first set, for the Survey of Consumer Finance, applies to the original database on which the SPSD was built. The second set of sample counts for the SPSD itself are higher because they reflect the additional microdata that have been merged, particularly from samples of personal income tax returns in the top five per cent of the income spectrum, and from unemployment insurance claim histories in the rest of the income spectrum. It may be noted that income data for original SCF individual records with over $80,000 in reported income have been completely replaced by data from a corresponding sample of about 25,000 individual income tax returns. In order to preserve the confidentiality of this income tax information, these 25,000 records have been collapsed into 5,000 synthetic records in a way that still accurately portrays the distribution and composition of total income by source amongst this high income group. For a more complete description of how the SPSD was assembled, the interested reader is referred to Wolfson et. al, "The Social Policy Simulation Database. An Example of Survey and Administrative Data Integration" (Ottawa: Statistics Canada, 1988), presented at the NBER 50th Annual Conference on Income and Wealth, Washington, D.C., May 1988.

Appendix Table 1

SPSD Sample Counts
(census family units)

Percentile Income	Original SCF	SPSD Records, Taking Account of Synthetically Merged Income Tax and UI Claim Records			
		All Family Types	Broad Family Types		
			FA	OAS	Other
0 - 10 *	3,518	5,301	894	488	3,919
10 - 20	5,015	6,487	941	3,611	1,935
20 - 30	4,169	6,338	1,411	1,898	3,029
30 - 40	4,253	6,660	1,812	1,848	3,000
40 - 50	4,186	6,744	2,335	1,066	3,343
50 - 60	4,281	6,902	3,107	664	3,131
60 - 70	4,142	6,717	3,131	476	3,110
70 - 80	3,852	6,271	3,310	331	2,630
80 - 90	3,767	5,960	3,190	376	2,394
90 - 95	1,778	2,689	1,309	143	1,237
95 - 99	1,207	2,631	995	366	1,270
99 - 100	284	3,554	1,900	392	1,262
All	**40,452**	**66,254**	**24,335**	**11,659**	**30,260**

* excluding census families with non-positive total income, as for all charts in the main text showing dispersion in ATRs.

INSTITUTE DISCUSSION PAPERS
STUDIES IN SOCIAL POLICY PROGRAM

SERIES "A" - Demographic/Economic/Social Interrelations

1987

The following papers were prepared in connection with phase one of Health and Welfare's Canada's Review of Demography and its Implications for Economic and Social Policy (The Demographic Review).

87.A.0	Demographic Change and the Canadian Economy: An Overview	S.B. Seward
87.A.1	Some Observations on Demography in Selected Macroeconometric Models of Canada	R.G. Bodkin & K. Marwah
87.A.2	Population Change and the Canadian Economy: A Survey of the Issues	F.T. Denton & B.G. Spencer (a)
87.A.3	Population Change and the Future Labour Force: A Discussion Paper	F.T. Denton & B.G. Spencer (b)
87.A.4	Population Aging and Government Deficits in Canada	D.K. Foot (a)
87.A.5	Population Aging and the Canadian Labour Force	D.K. Foot (b)
87.A.6	The Role of Migration in Balancing Regional Supply and Demand Discrepancies	E.K. Grant & J. Vanderkamp
87.A.7	Ethnicity and the Labour Force: A Discussion Paper	W.E. Kalbach
87.A.8	L'avenir demographique du Canada et les groupes linguistiques	R. Lachapelle
87.A.9	Consumption and Saving Patterns of the Foreign-Born in Canada	W.L. Marr
87.A.10	The Relationship Between Immigration and the Canadian Economy	S.B. Seward
87.A.11	Women's Labour Force Participation, Fertility Rates, and the Implications for Economic Development and Government Policy	M. Townson
87.A.12	Fertility and the Labour Force in Canada: Critical Issues	C. Vlassoff

---

SERIES "B" - Immigration Issues

1987

87.B.1	The Economic Impact of the Entrepreneur Immigrant Program	A. Nash
*	See also 87.A.7, 87.A.9 and 87.A.10 in Series "A"	

1988

88.B.1	Barriers to Recognition of The Credentials of Immigrants in Canada	K. McDade
	Immigrant Women in Canada: A Policy Perspective (Published by the Canadian Advisory Council on the Status of Women)	S.B. Seward K. McDade

---

SERIES "C" - Social Policy, including Income Security

1987

87.C.1	Social Policy in Canada: The Past As It Conditions the Present	A.W. Johnson
87.C.2	Equal Pay for Work of Equal Value Legislation in Canada: An Analysis	H.E. Conway

1988

88.C.1	Distributional Impacts of Personal Income Tax Reform 1984 To 1988	A.M. Maslove